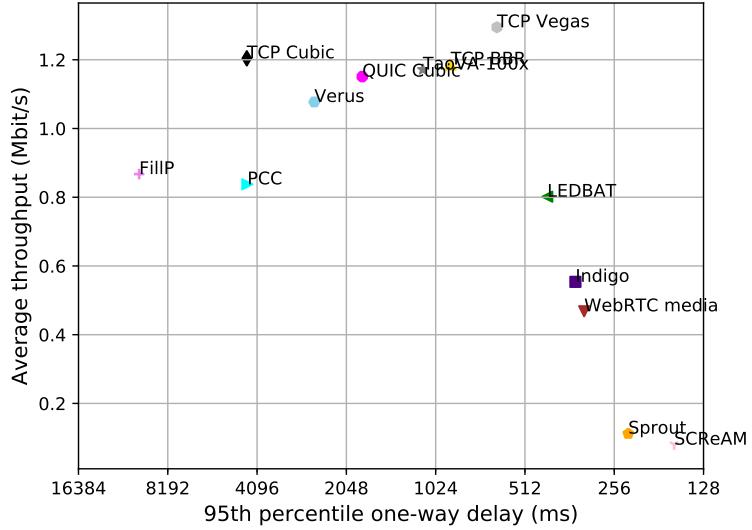


Pantheon Report

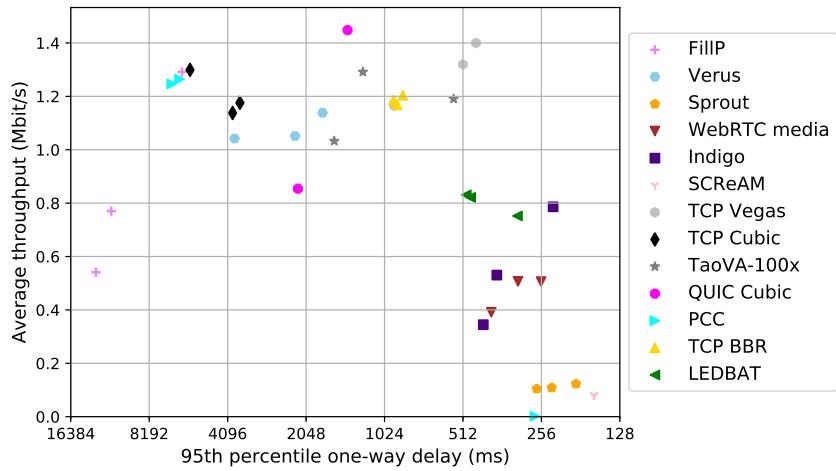
Generated at 2017-12-20 17:49:42 (UTC).
Data path: AWS Brazil 2 Ethernet (*local*) → Colombia ppp0 (*remote*).
Repeated the test of 14 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).
NTP offsets were measured against **gps.ntp.br** and have been applied to correct the timestamps in logs.

Git summary:
branch: master @ 904a5750834816b1e46a2c86405d707788d27c16
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
M datagrump/sender.cc
third_party/fillp @ dcaef6b00654e660f73f7ed679d2eab61ce08639
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bfe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42

test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme



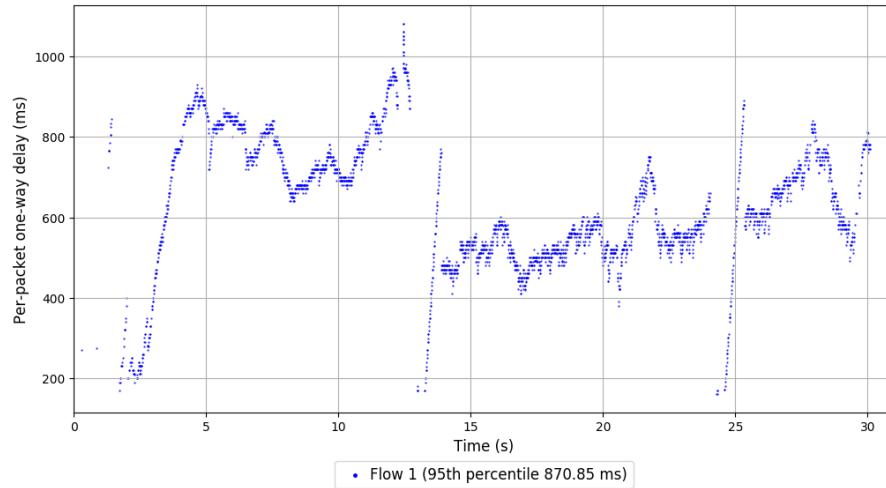
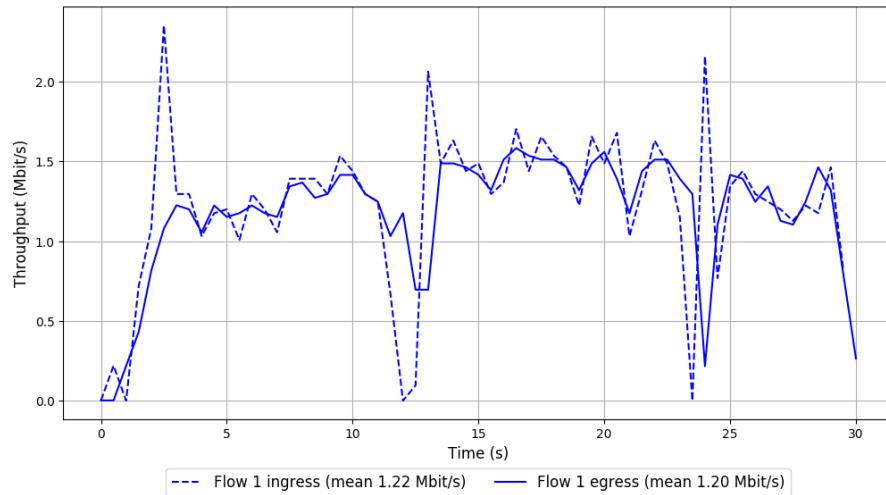
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.19	911.20	1.92
TCP Cubic	3	1.21	4436.22	17.95
LEDBAT	3	0.80	430.77	0.49
PCC	3	0.84	4417.38	58.85
QUIC Cubic	2	1.15	1810.12	4.96
SCReAM	3	0.08	160.81	0.13
WebRTC media	3	0.47	323.39	0.27
Sprout	3	0.11	229.64	0.35
TaoVA-100x	3	1.17	1131.02	1.01
TCP Vegas	3	1.29	636.35	0.31
Verus	3	1.08	2626.99	7.85
Copa	0	N/A	N/A	N/A
FillP	3	0.87	10232.29	97.33
Indigo	3	0.55	346.08	0.11

Run 1: Statistics of TCP BBR

```
Start at: 2017-12-20 16:58:25
End at: 2017-12-20 16:58:55
Local clock offset: -0.024 ms
Remote clock offset: 16.125 ms

# Below is generated by plot.py at 2017-12-20 17:49:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 870.845 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 870.845 ms
Loss rate: 1.90%
```

Run 1: Report of TCP BBR — Data Link

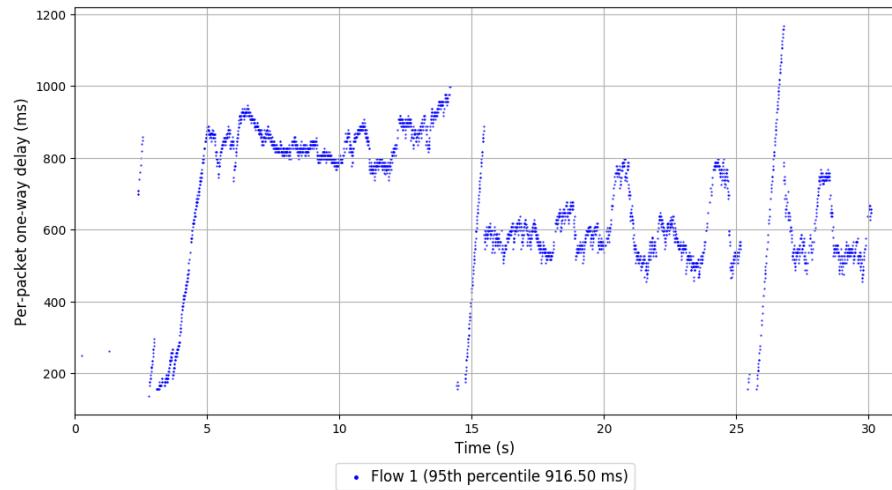
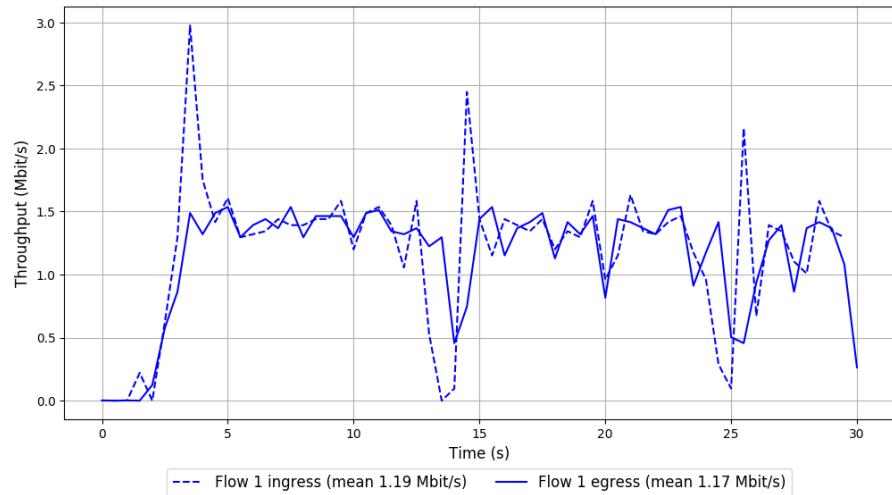


Run 2: Statistics of TCP BBR

```
Start at: 2017-12-20 17:16:07
End at: 2017-12-20 17:16:37
Local clock offset: -0.09 ms
Remote clock offset: 15.764 ms

# Below is generated by plot.py at 2017-12-20 17:49:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 916.503 ms
Loss rate: 2.09%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 916.503 ms
Loss rate: 2.09%
```

Run 2: Report of TCP BBR — Data Link

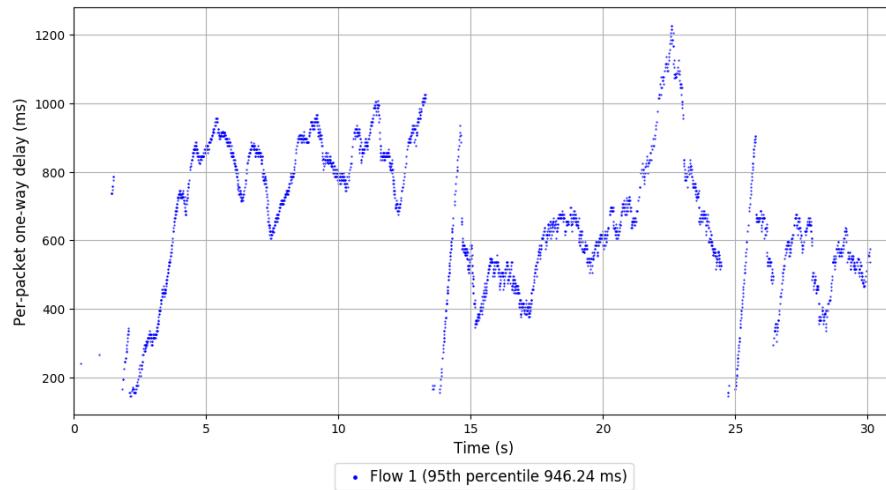
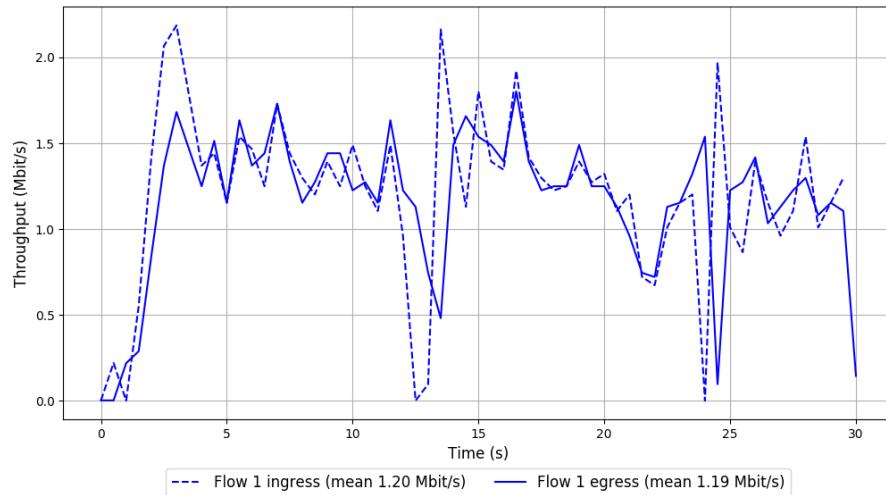


Run 3: Statistics of TCP BBR

```
Start at: 2017-12-20 17:33:45
End at: 2017-12-20 17:34:15
Local clock offset: -0.025 ms
Remote clock offset: 15.687 ms

# Below is generated by plot.py at 2017-12-20 17:49:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 946.244 ms
Loss rate: 1.76%
-- Flow 1:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 946.244 ms
Loss rate: 1.76%
```

Run 3: Report of TCP BBR — Data Link

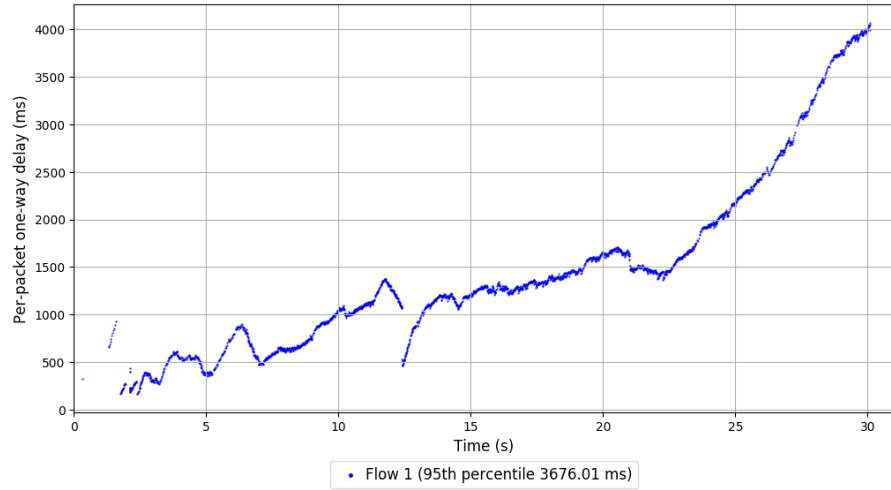
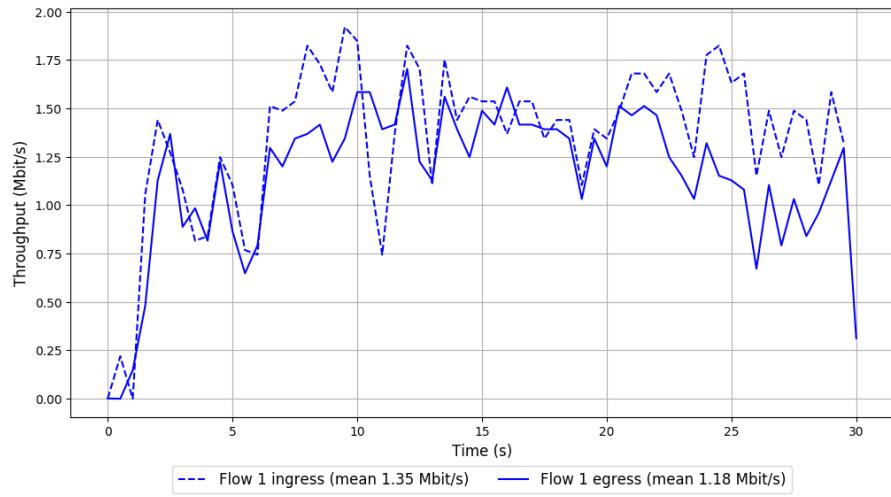


Run 1: Statistics of TCP Cubic

```
Start at: 2017-12-20 17:09:03
End at: 2017-12-20 17:09:33
Local clock offset: -0.041 ms
Remote clock offset: 16.18 ms

# Below is generated by plot.py at 2017-12-20 17:49:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 3676.007 ms
Loss rate: 13.39%
-- Flow 1:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 3676.007 ms
Loss rate: 13.39%
```

Run 1: Report of TCP Cubic — Data Link

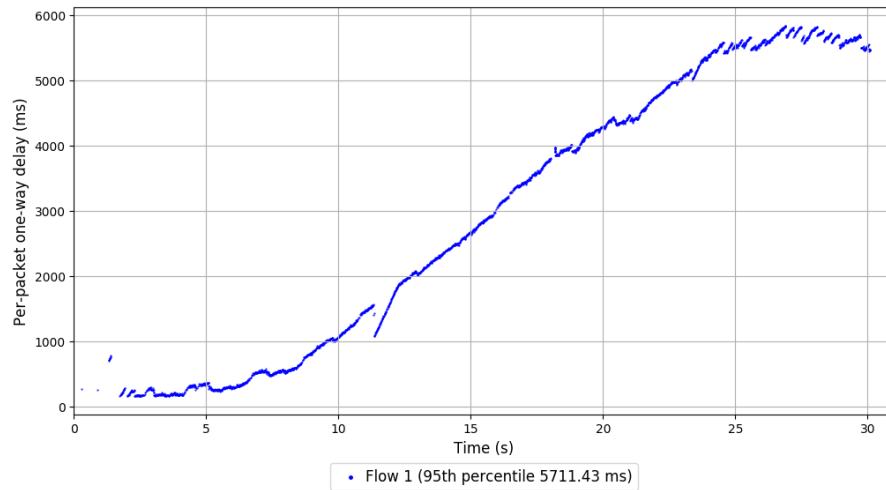
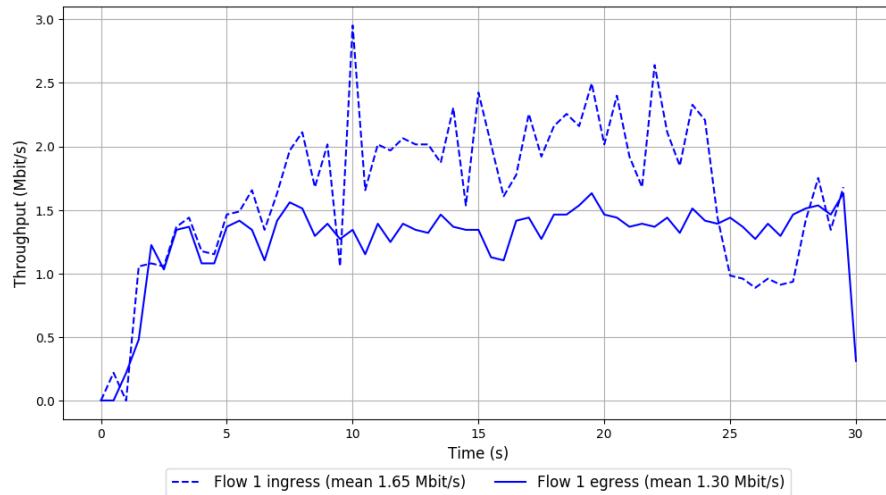


Run 2: Statistics of TCP Cubic

```
Start at: 2017-12-20 17:26:42
End at: 2017-12-20 17:27:12
Local clock offset: -0.021 ms
Remote clock offset: 15.971 ms

# Below is generated by plot.py at 2017-12-20 17:49:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 5711.430 ms
Loss rate: 21.63%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 5711.430 ms
Loss rate: 21.63%
```

Run 2: Report of TCP Cubic — Data Link

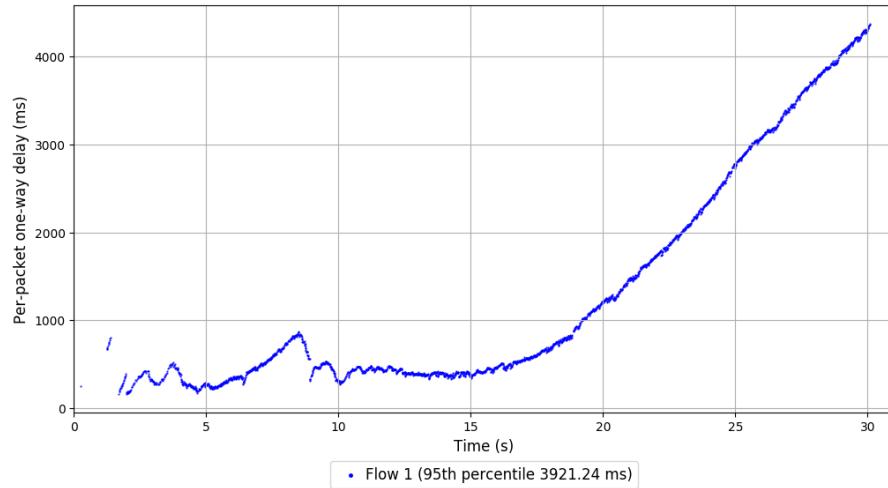
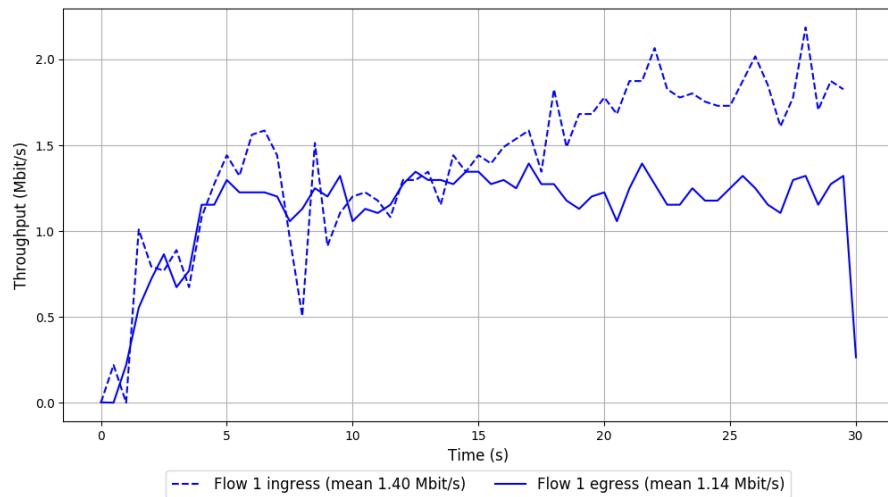


Run 3: Statistics of TCP Cubic

```
Start at: 2017-12-20 17:44:21
End at: 2017-12-20 17:44:51
Local clock offset: -0.023 ms
Remote clock offset: 9.934 ms

# Below is generated by plot.py at 2017-12-20 17:49:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 3921.235 ms
Loss rate: 18.83%
-- Flow 1:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 3921.235 ms
Loss rate: 18.83%
```

Run 3: Report of TCP Cubic — Data Link

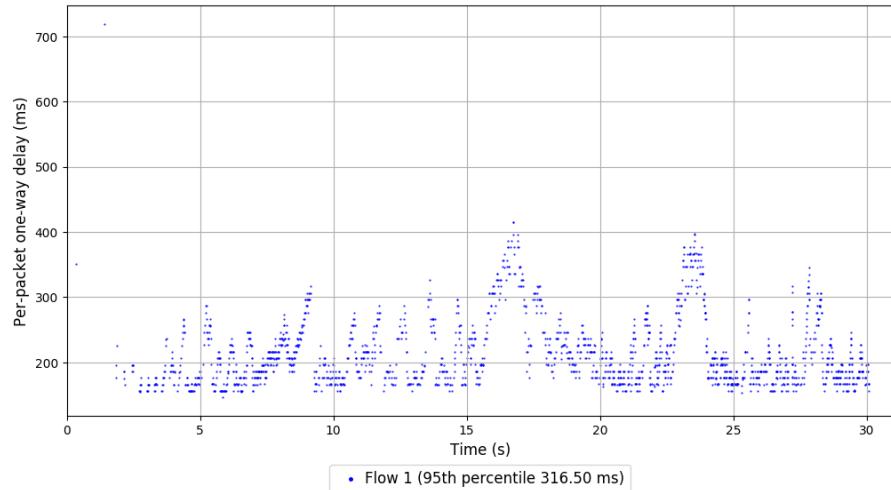
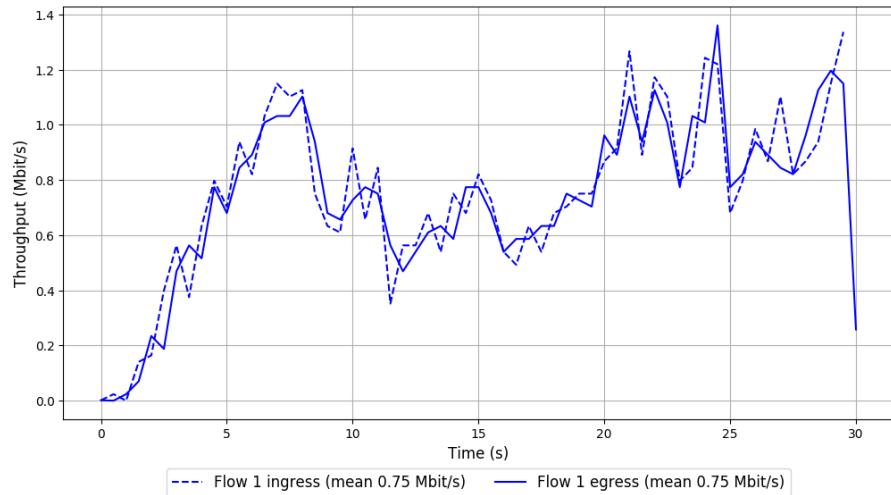


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2017-12-20 17:11:24
End at: 2017-12-20 17:11:54
Local clock offset: -0.03 ms
Remote clock offset: 15.714 ms

# Below is generated by plot.py at 2017-12-20 17:49:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 316.497 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 316.497 ms
Loss rate: 0.63%
```

Run 1: Report of LEDBAT — Data Link

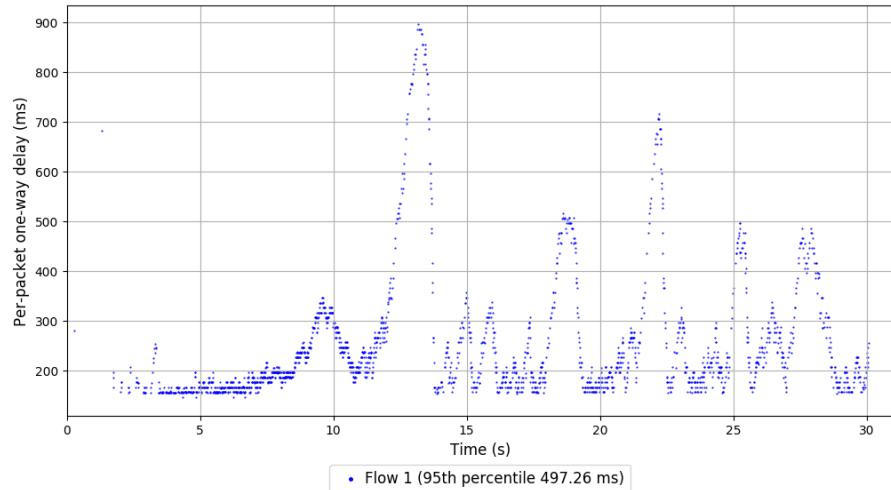
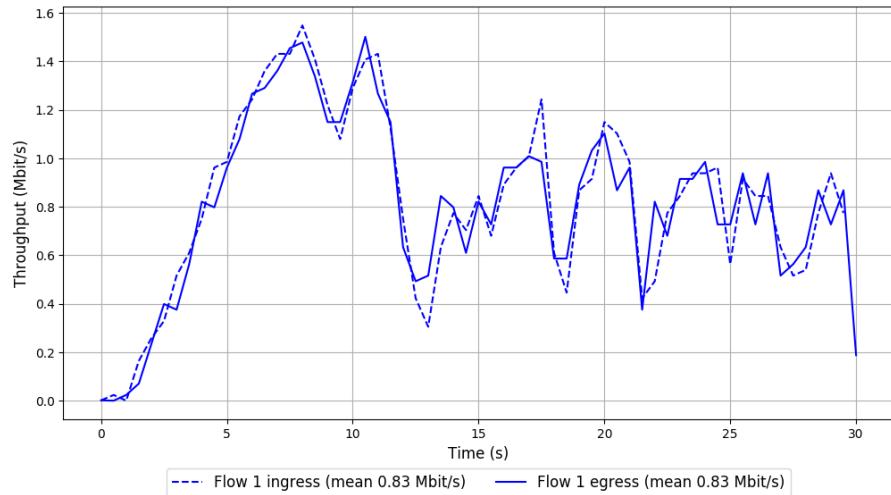


Run 2: Statistics of LEDBAT

```
Start at: 2017-12-20 17:29:03
End at: 2017-12-20 17:29:33
Local clock offset: -0.027 ms
Remote clock offset: 15.693 ms

# Below is generated by plot.py at 2017-12-20 17:49:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 497.258 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 497.258 ms
Loss rate: 0.42%
```

Run 2: Report of LEDBAT — Data Link

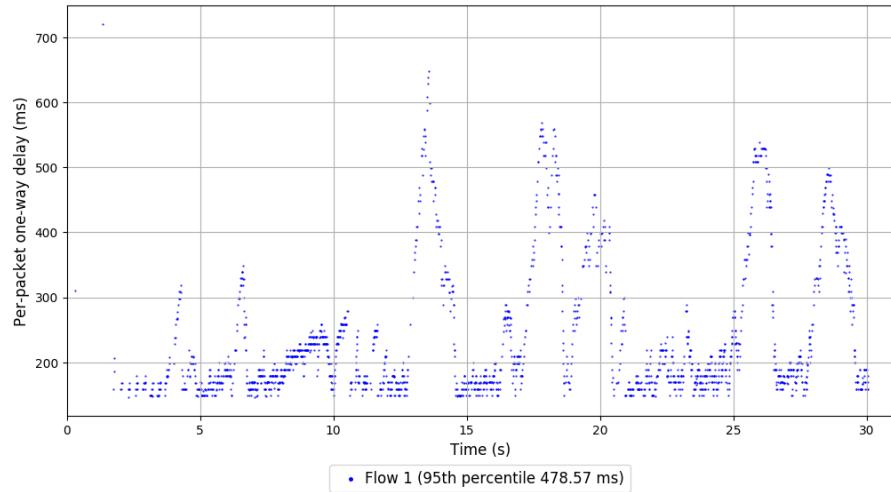
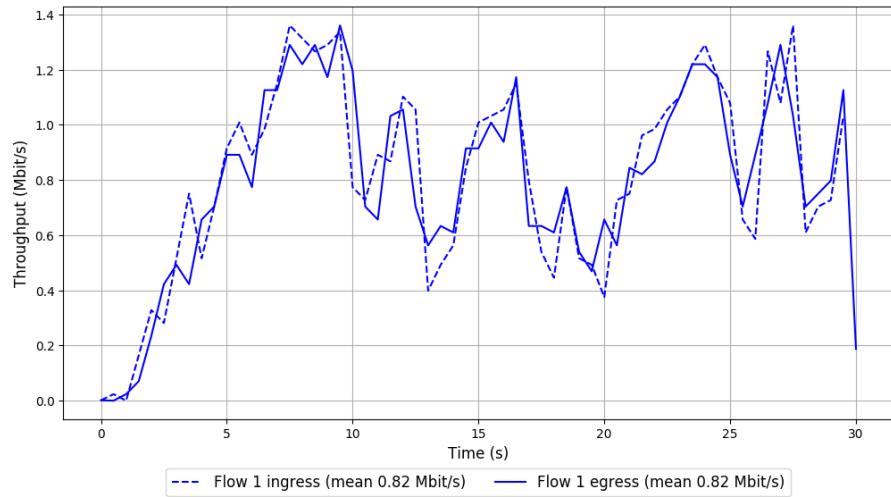


Run 3: Statistics of LEDBAT

```
Start at: 2017-12-20 17:46:41
End at: 2017-12-20 17:47:11
Local clock offset: -0.019 ms
Remote clock offset: 14.666 ms

# Below is generated by plot.py at 2017-12-20 17:49:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 478.568 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 478.568 ms
Loss rate: 0.43%
```

Run 3: Report of LEDBAT — Data Link

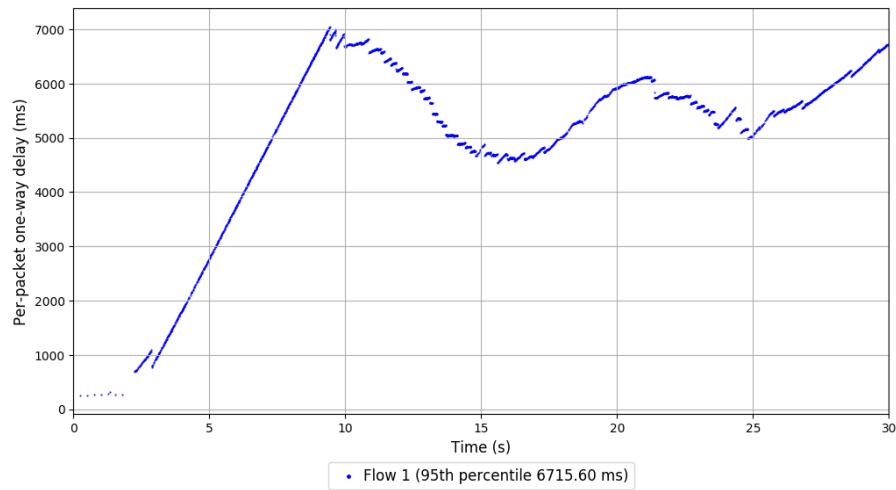
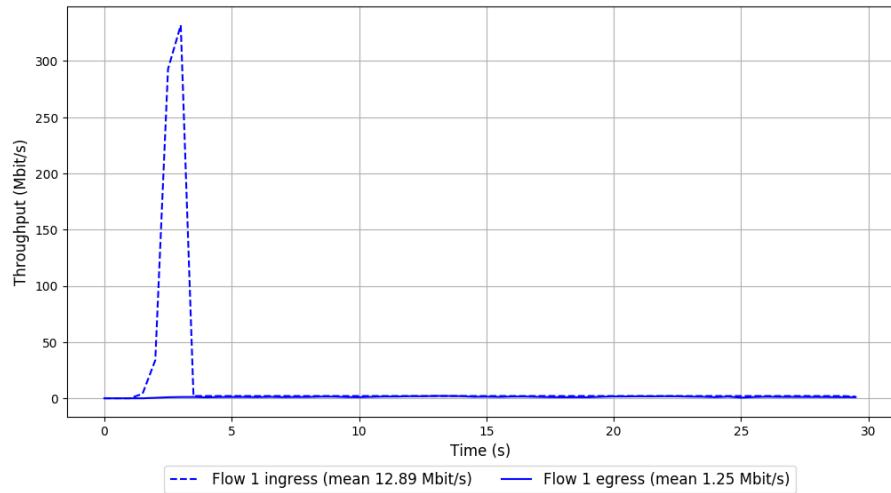


Run 1: Statistics of PCC

```
Start at: 2017-12-20 17:03:08
End at: 2017-12-20 17:03:38
Local clock offset: -0.016 ms
Remote clock offset: 9.555 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 6715.599 ms
Loss rate: 90.38%
-- Flow 1:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 6715.599 ms
Loss rate: 90.38%
```

Run 1: Report of PCC — Data Link

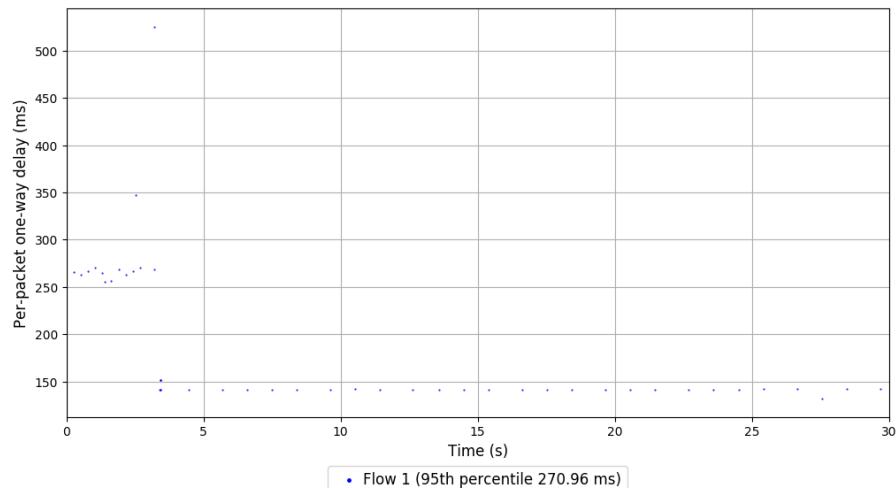
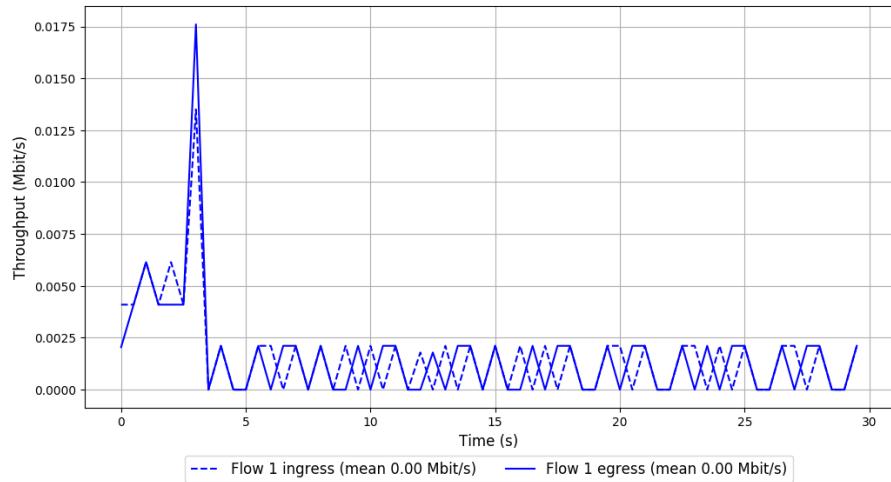


Run 2: Statistics of PCC

```
Start at: 2017-12-20 17:20:49
End at: 2017-12-20 17:21:19
Local clock offset: -0.088 ms
Remote clock offset: 10.903 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 270.964 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 270.964 ms
Loss rate: 0.00%
```

Run 2: Report of PCC — Data Link

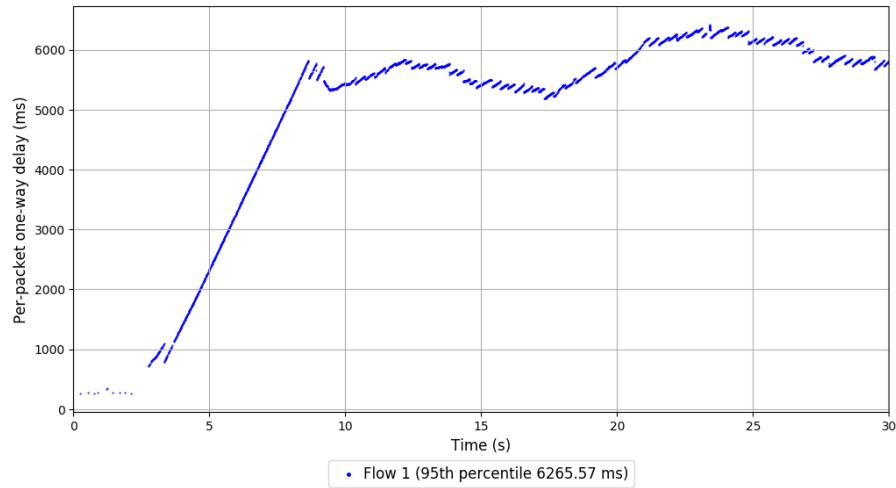
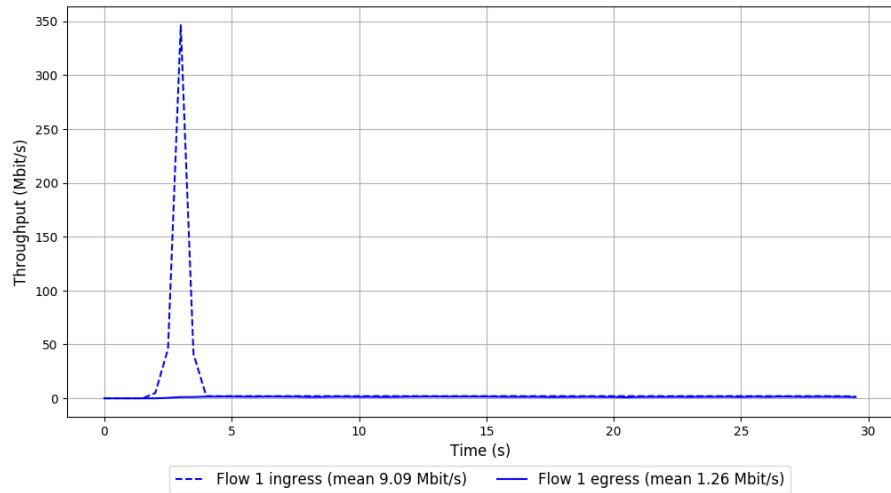


Run 3: Statistics of PCC

```
Start at: 2017-12-20 17:38:28
End at: 2017-12-20 17:38:58
Local clock offset: -0.103 ms
Remote clock offset: 15.728 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 6265.567 ms
Loss rate: 86.17%
-- Flow 1:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 6265.567 ms
Loss rate: 86.17%
```

Run 3: Report of PCC — Data Link



```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2017-12-20 17:12:34
```

```
End at: 2017-12-20 17:13:04
```

```
Local clock offset: -0.019 ms
```

```
Remote clock offset: 10.885 ms
```

```
# Below is generated by plot.py at 2017-12-20 17:49:28
```

```
# Datalink statistics
```

```
-- Total of 1 flow:
```

```
Average throughput: 1.45 Mbit/s
```

```
95th percentile per-packet one-way delay: 1419.488 ms
```

```
Loss rate: 5.00%
```

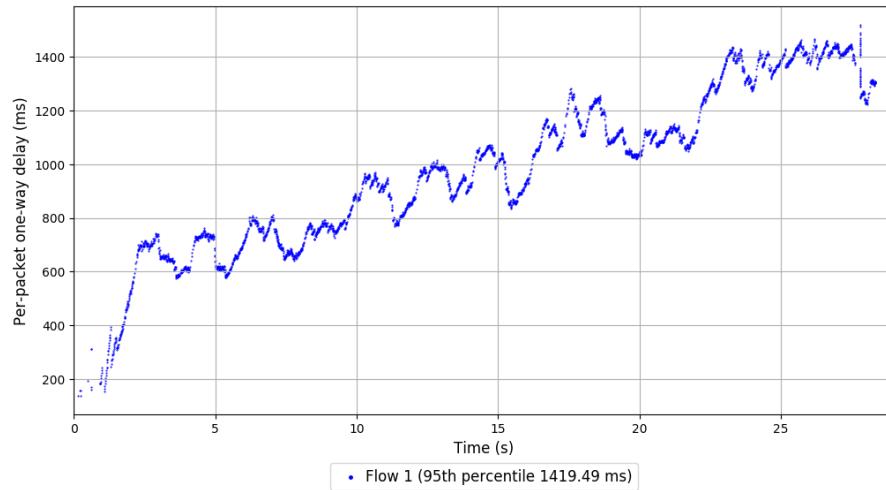
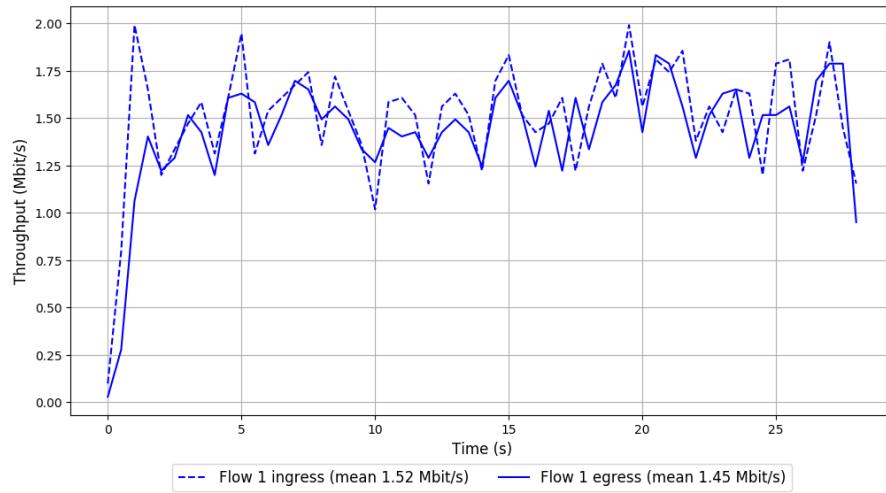
```
-- Flow 1:
```

```
Average throughput: 1.45 Mbit/s
```

```
95th percentile per-packet one-way delay: 1419.488 ms
```

```
Loss rate: 5.00%
```

Run 1: Report of QUIC Cubic — Data Link

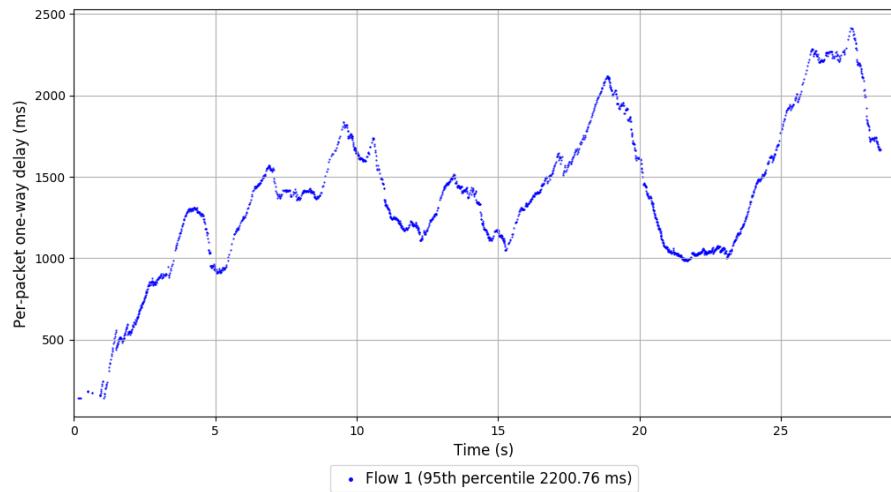
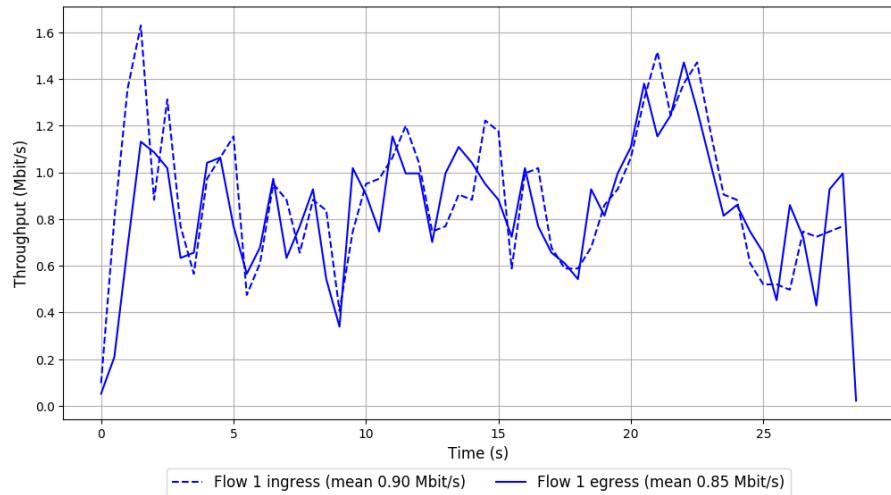


Run 2: Statistics of QUIC Cubic

```
Start at: 2017-12-20 17:30:13
End at: 2017-12-20 17:30:43
Local clock offset: -0.022 ms
Remote clock offset: 10.026 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 2200.761 ms
Loss rate: 4.93%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 2200.761 ms
Loss rate: 4.93%
```

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

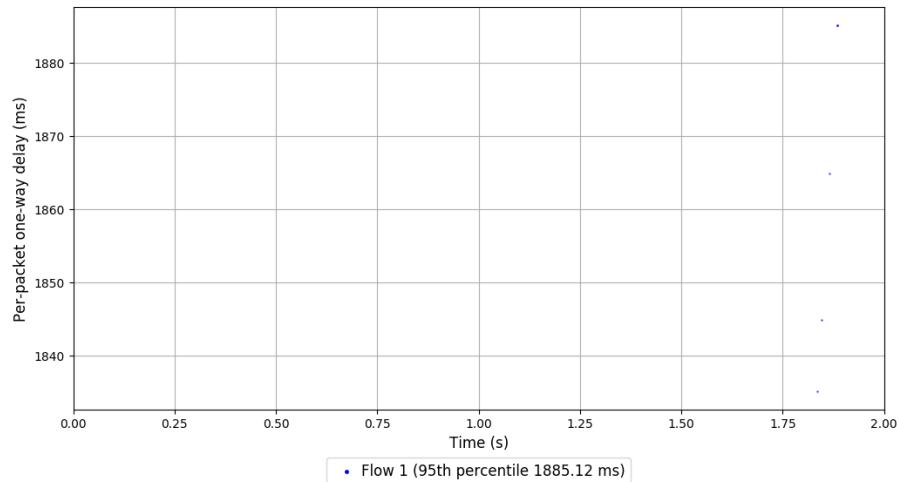
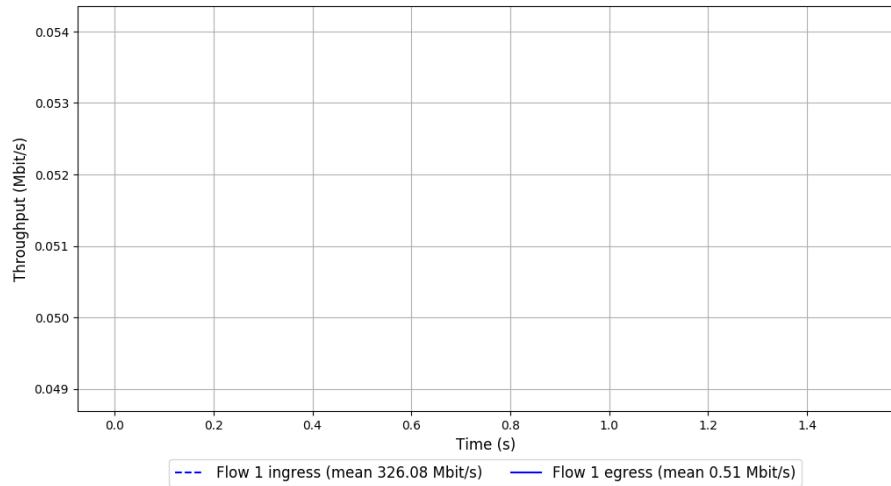
Start at: 2017-12-20 17:47:51

End at: 2017-12-20 17:48:21

Local clock offset: -0.04 ms

Remote clock offset: 14.781 ms

Run 3: Report of QUIC Cubic — Data Link

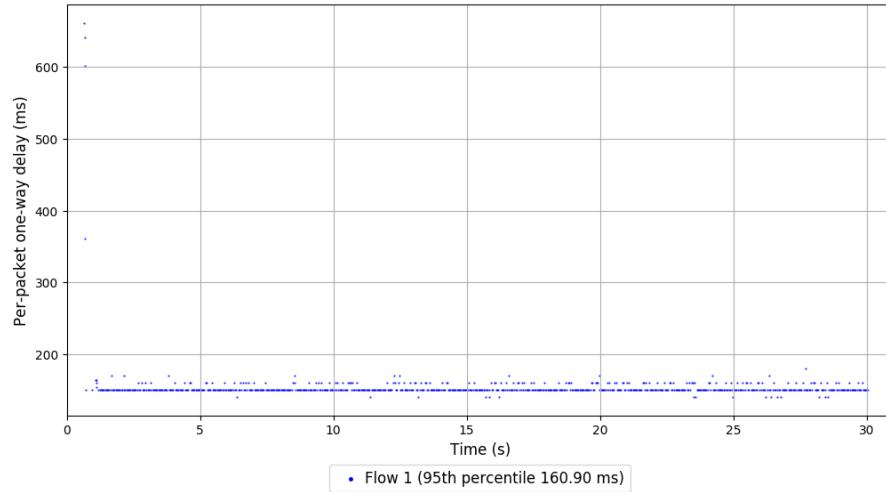
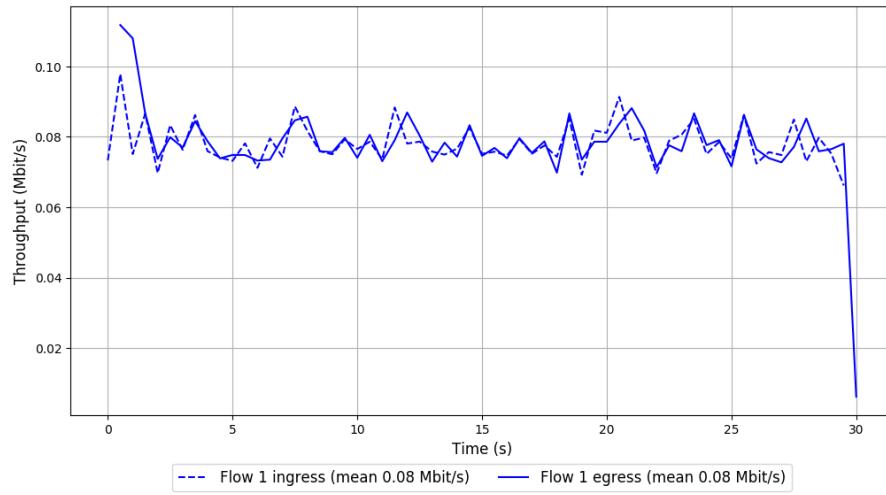


```
Run 1: Statistics of SCReAM
```

```
Start at: 2017-12-20 17:10:13
End at: 2017-12-20 17:10:43
Local clock offset: -0.011 ms
Remote clock offset: 15.762 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 160.895 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 160.895 ms
Loss rate: 0.13%
```

Run 1: Report of SCReAM — Data Link

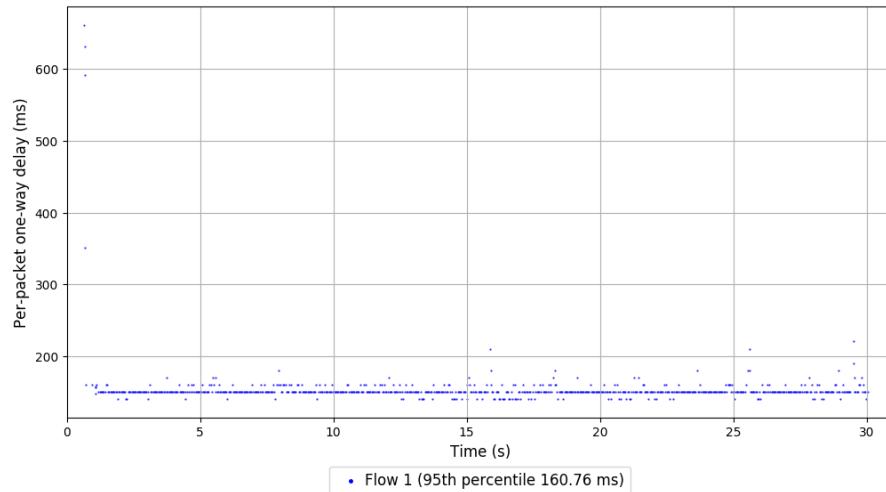
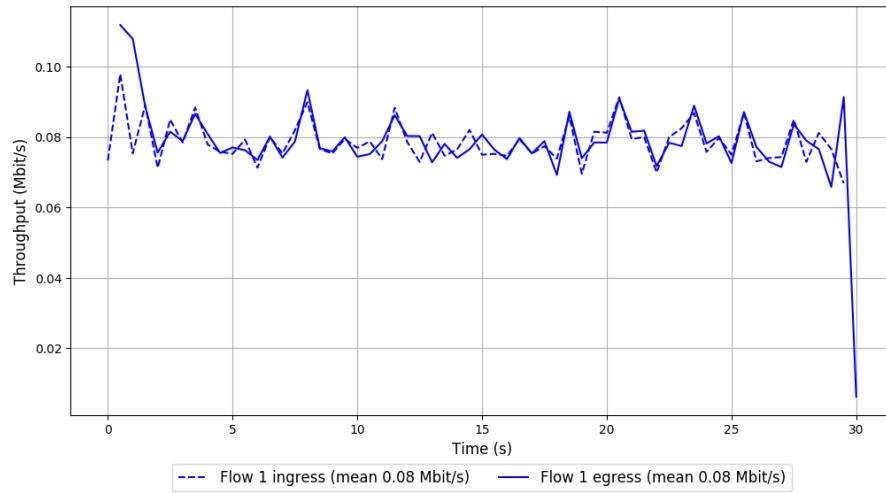


Run 2: Statistics of SCReAM

```
Start at: 2017-12-20 17:27:53
End at: 2017-12-20 17:28:23
Local clock offset: -0.044 ms
Remote clock offset: 15.738 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 160.758 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 160.758 ms
Loss rate: 0.13%
```

Run 2: Report of SCReAM — Data Link

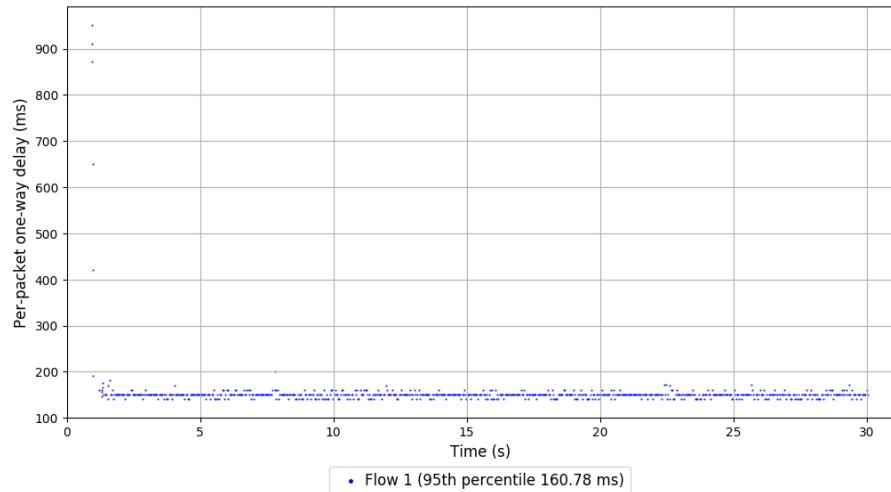
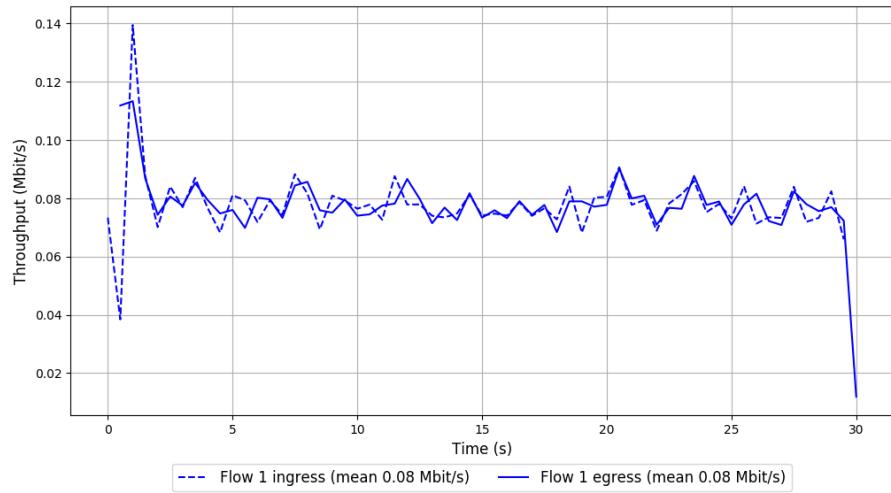


Run 3: Statistics of SCReAM

```
Start at: 2017-12-20 17:45:31
End at: 2017-12-20 17:46:01
Local clock offset: -0.036 ms
Remote clock offset: 15.709 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 160.782 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 160.782 ms
Loss rate: 0.13%
```

Run 3: Report of SCReAM — Data Link

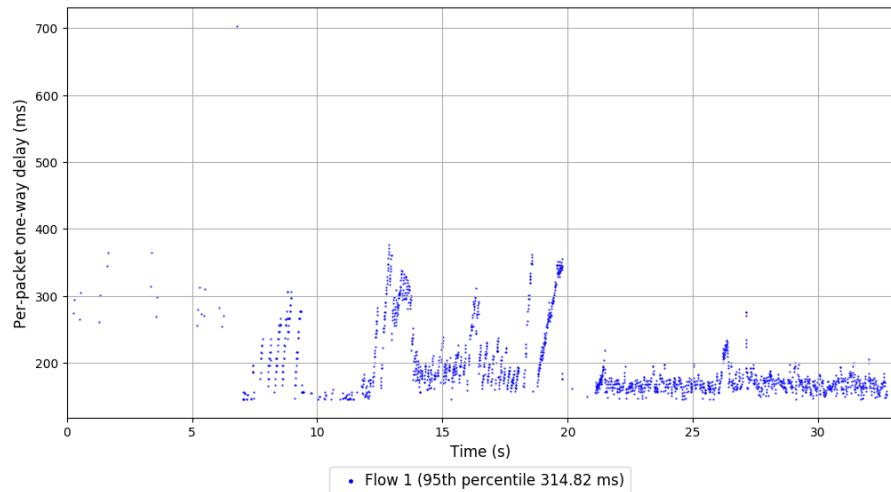
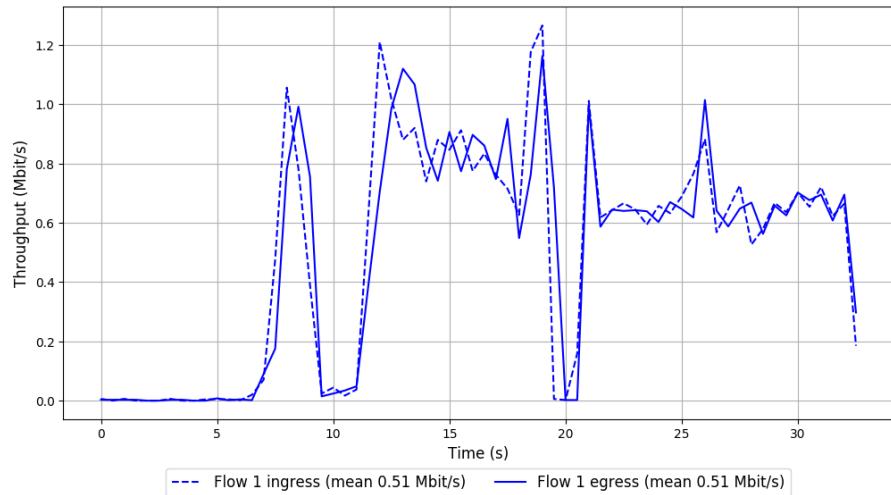


```
Run 1: Statistics of WebRTC media
```

```
Start at: 2017-12-20 16:59:36
End at: 2017-12-20 17:00:06
Local clock offset: -0.024 ms
Remote clock offset: 15.248 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 314.816 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 314.816 ms
Loss rate: 0.29%
```

Run 1: Report of WebRTC media — Data Link

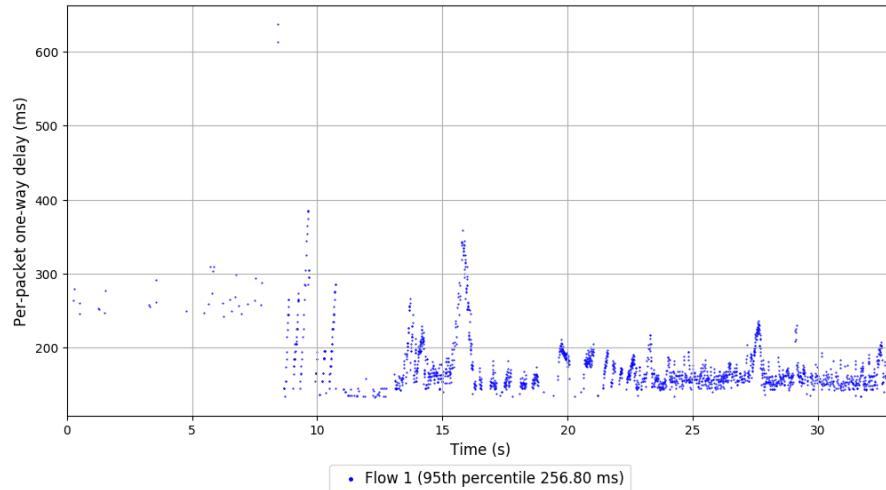
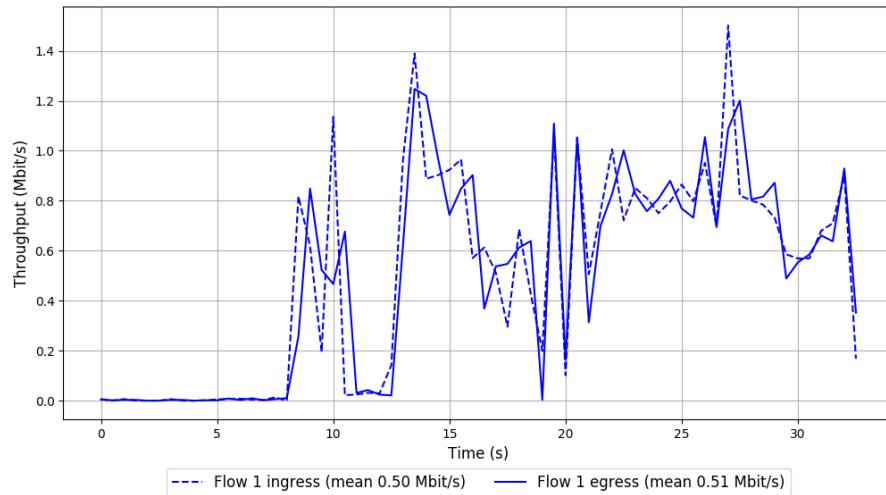


Run 2: Statistics of WebRTC media

```
Start at: 2017-12-20 17:17:17
End at: 2017-12-20 17:17:47
Local clock offset: -0.019 ms
Remote clock offset: 10.893 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 256.795 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 256.795 ms
Loss rate: 0.22%
```

Run 2: Report of WebRTC media — Data Link

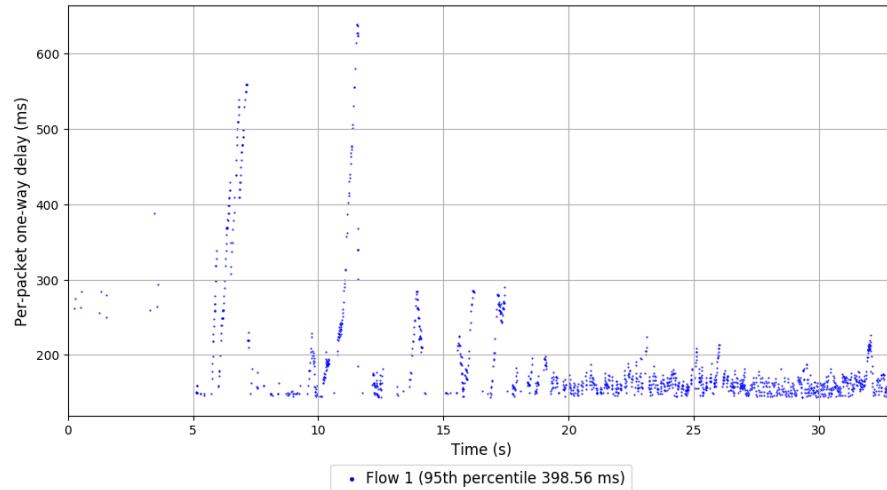
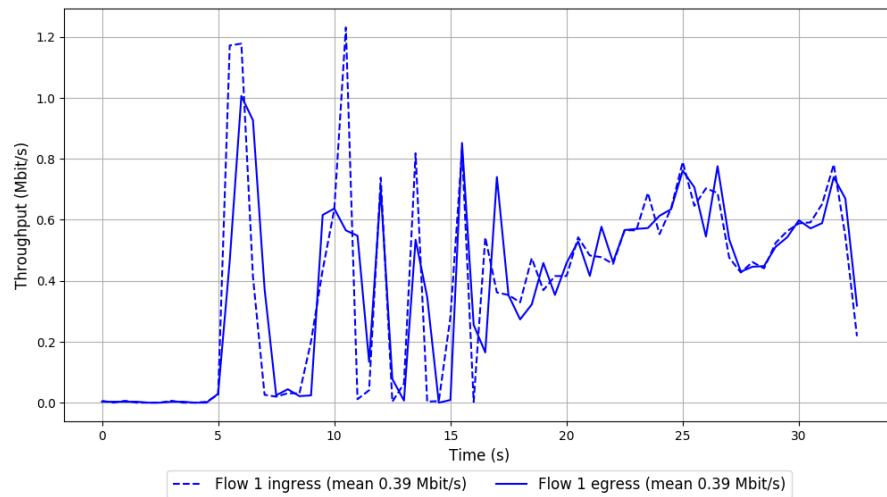


Run 3: Statistics of WebRTC media

```
Start at: 2017-12-20 17:34:56
End at: 2017-12-20 17:35:26
Local clock offset: -0.04 ms
Remote clock offset: 15.6 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 398.559 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 398.559 ms
Loss rate: 0.29%
```

Run 3: Report of WebRTC media — Data Link

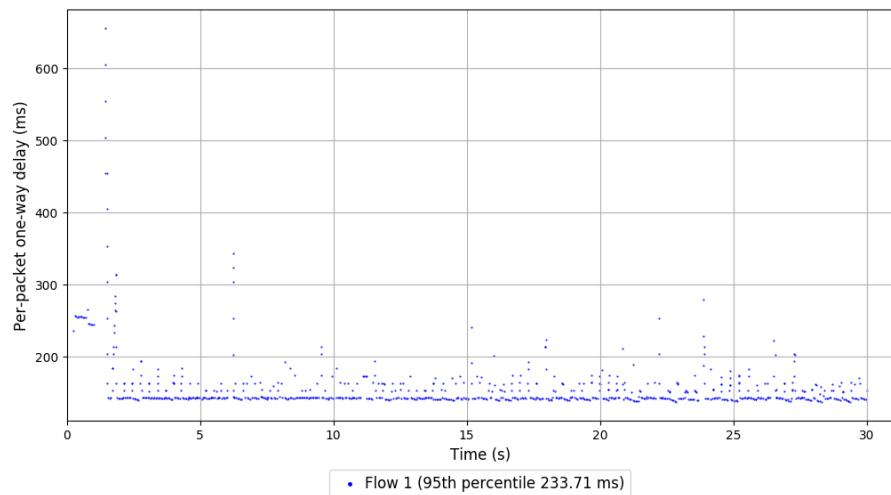
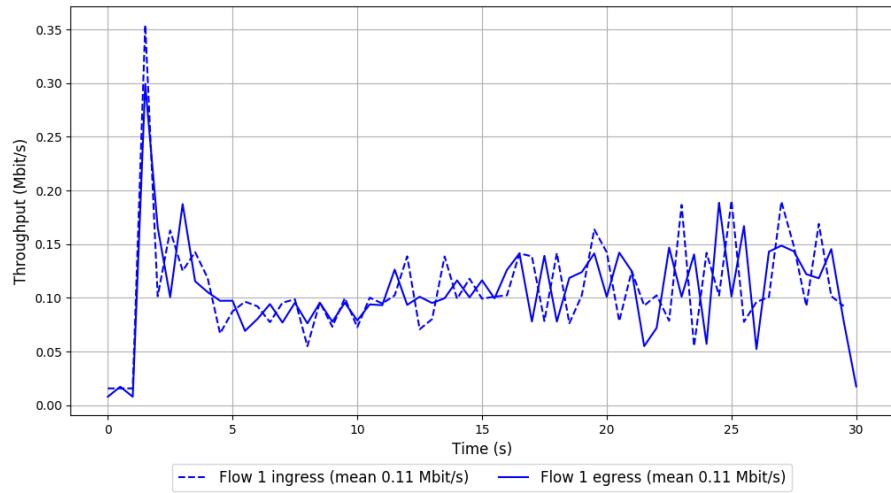


Run 1: Statistics of Sprout

```
Start at: 2017-12-20 17:01:57
End at: 2017-12-20 17:02:27
Local clock offset: -0.087 ms
Remote clock offset: 10.495 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 233.712 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 233.712 ms
Loss rate: 0.38%
```

Run 1: Report of Sprout — Data Link

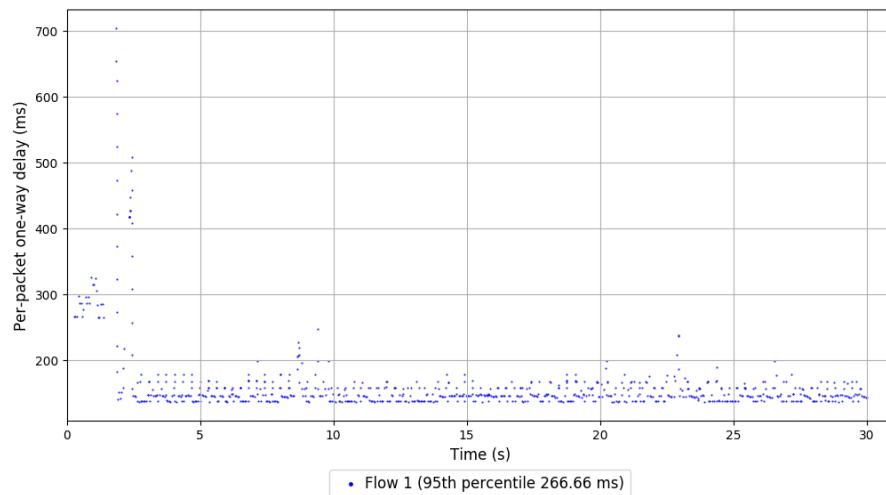
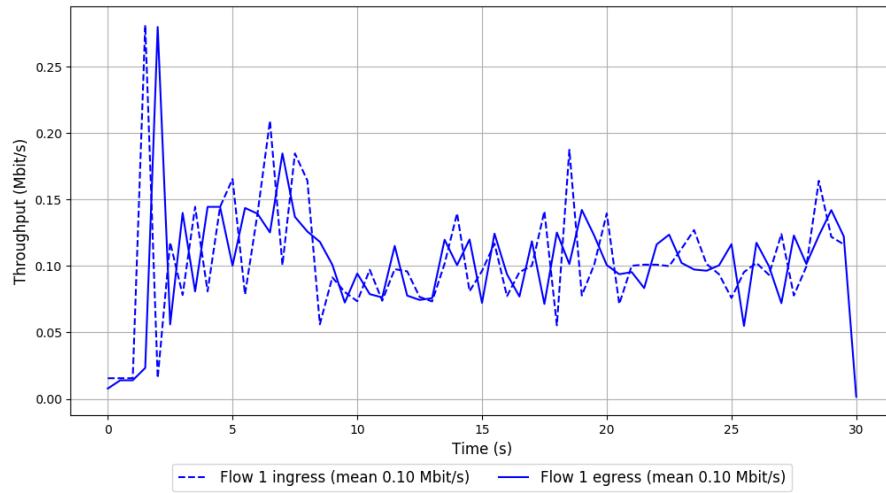


Run 2: Statistics of Sprout

```
Start at: 2017-12-20 17:19:38
End at: 2017-12-20 17:20:08
Local clock offset: -0.029 ms
Remote clock offset: 10.923 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 266.657 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 266.657 ms
Loss rate: 0.65%
```

Run 2: Report of Sprout — Data Link

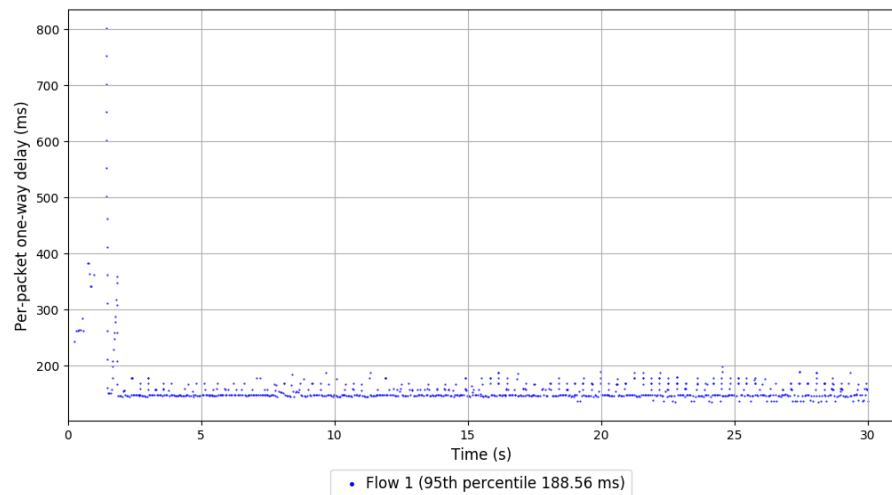
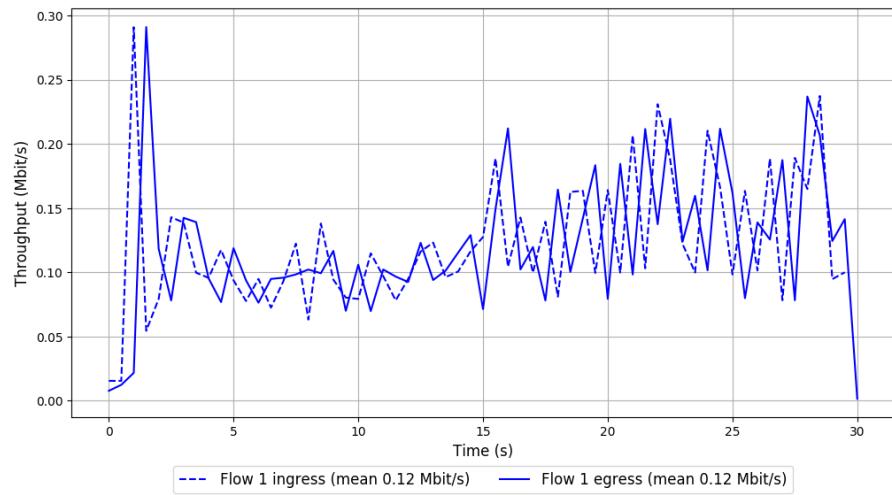


Run 3: Statistics of Sprout

```
Start at: 2017-12-20 17:37:17
End at: 2017-12-20 17:37:47
Local clock offset: -0.05 ms
Remote clock offset: 16.204 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 188.565 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 188.565 ms
Loss rate: 0.02%
```

Run 3: Report of Sprout — Data Link

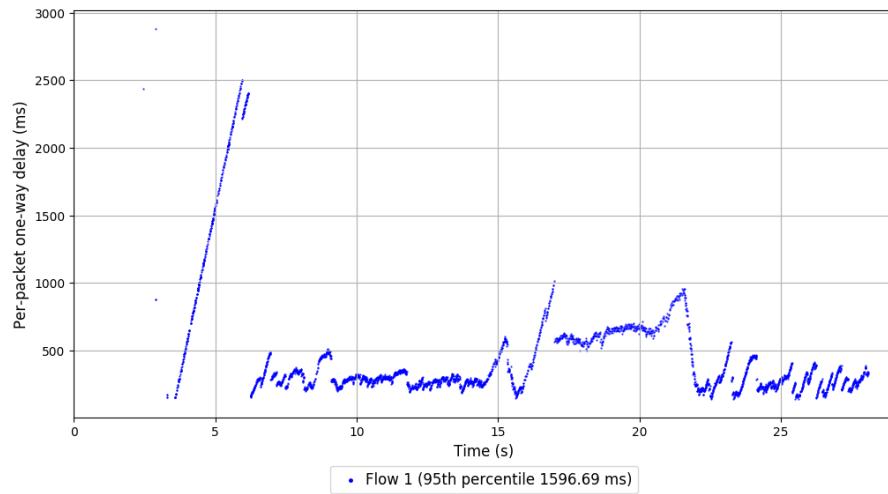
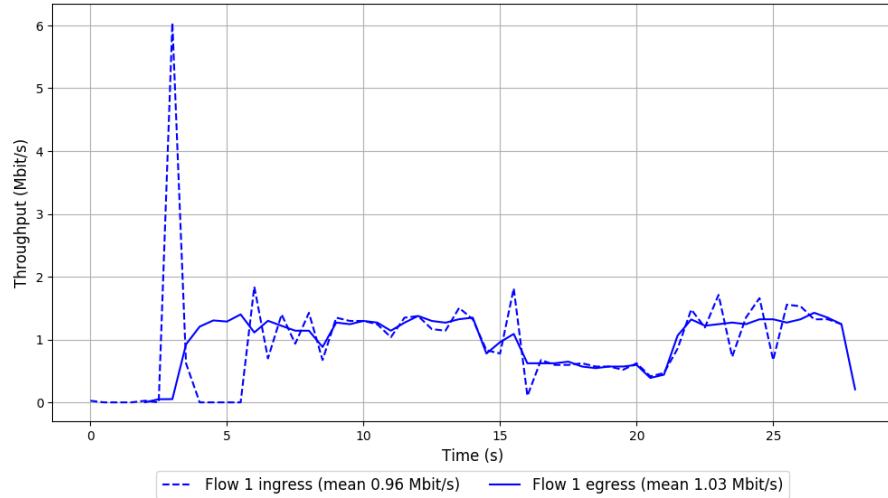


Run 1: Statistics of TaoVA-100x

```
Start at: 2017-12-20 16:57:14
End at: 2017-12-20 16:57:44
Local clock offset: -0.091 ms
Remote clock offset: 9.469 ms

# Below is generated by plot.py at 2017-12-20 17:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 1596.694 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 1596.694 ms
Loss rate: 1.11%
```

Run 1: Report of TaoVA-100x — Data Link

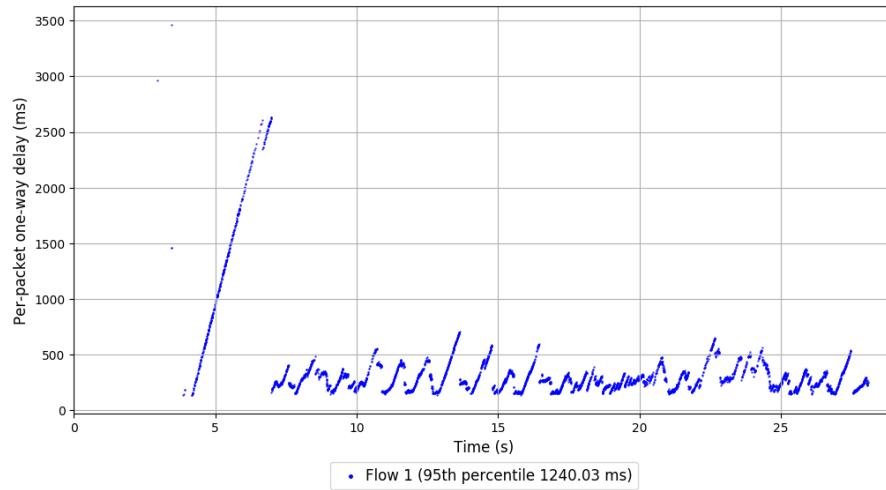
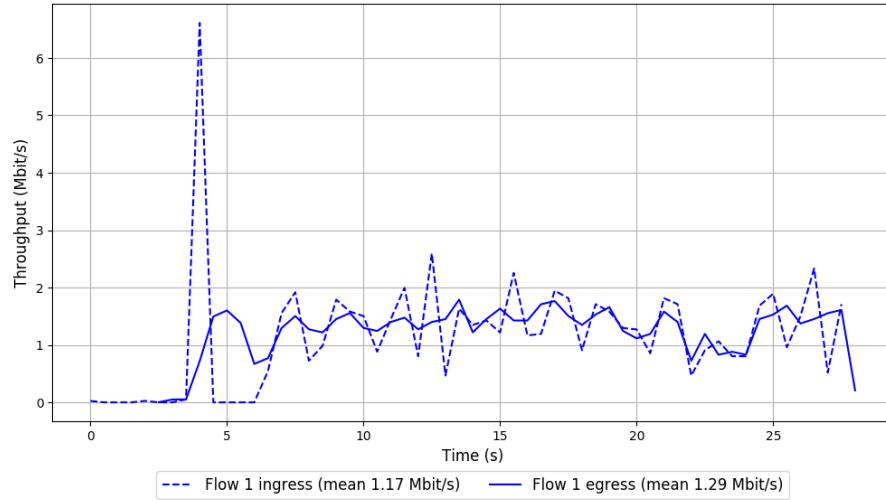


Run 2: Statistics of TaoVA-100x

```
Start at: 2017-12-20 17:14:56
End at: 2017-12-20 17:15:26
Local clock offset: -0.029 ms
Remote clock offset: 10.903 ms

# Below is generated by plot.py at 2017-12-20 17:49:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 1240.031 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 1240.031 ms
Loss rate: 0.63%
```

Run 2: Report of TaoVA-100x — Data Link

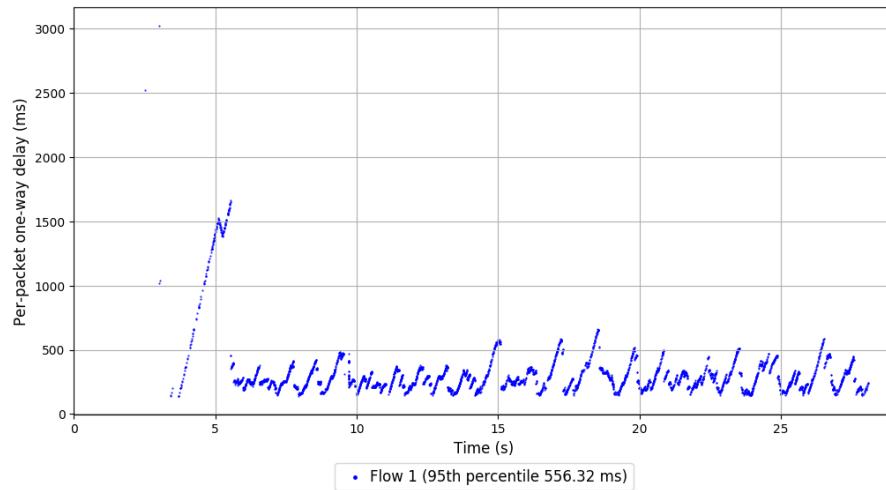
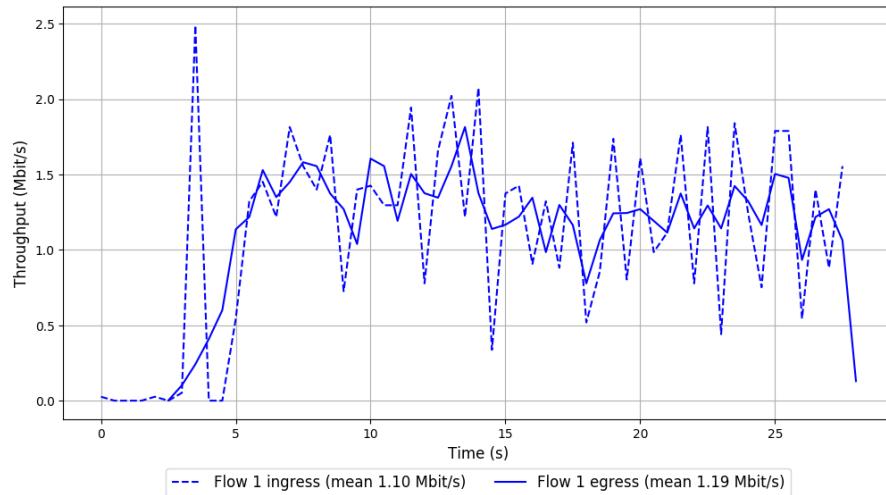


Run 3: Statistics of TaoVA-100x

```
Start at: 2017-12-20 17:32:34
End at: 2017-12-20 17:33:04
Local clock offset: -0.102 ms
Remote clock offset: 10.799 ms

# Below is generated by plot.py at 2017-12-20 17:49:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 556.324 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 556.324 ms
Loss rate: 1.30%
```

Run 3: Report of TaoVA-100x — Data Link

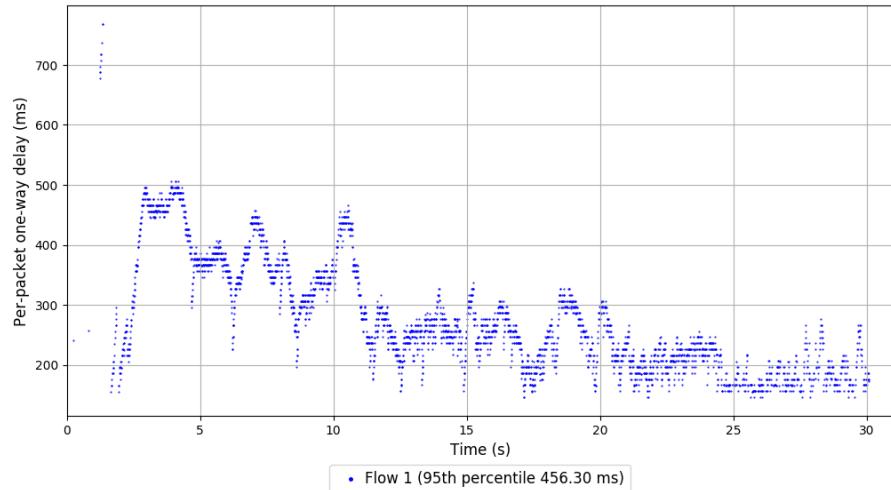
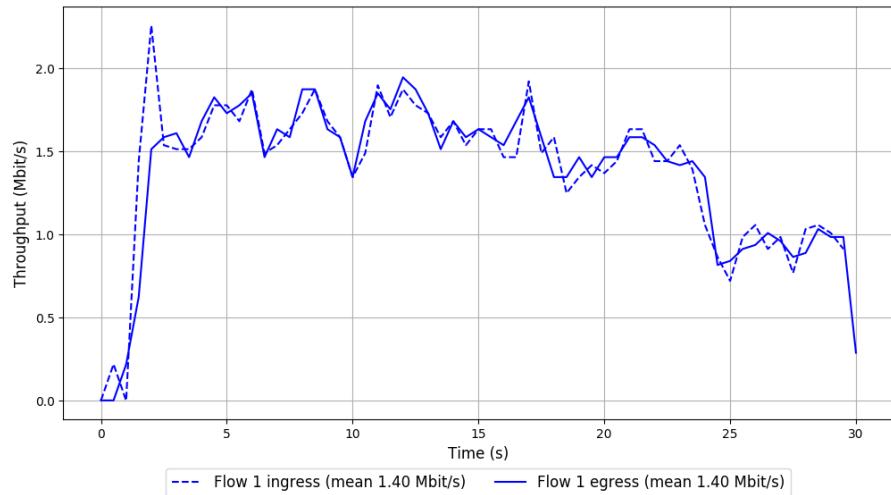


Run 1: Statistics of TCP Vegas

```
Start at: 2017-12-20 17:06:40
End at: 2017-12-20 17:07:10
Local clock offset: -0.031 ms
Remote clock offset: 15.355 ms

# Below is generated by plot.py at 2017-12-20 17:49:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 456.295 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 456.295 ms
Loss rate: 0.17%
```

Run 1: Report of TCP Vegas — Data Link

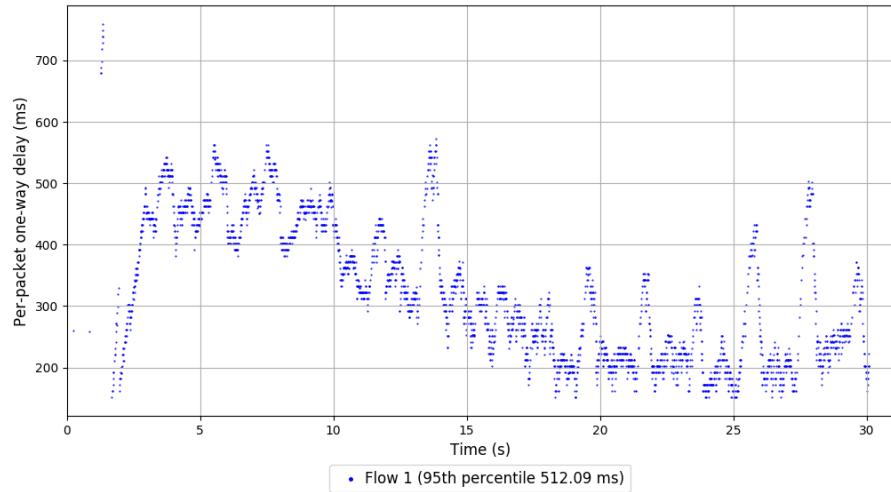
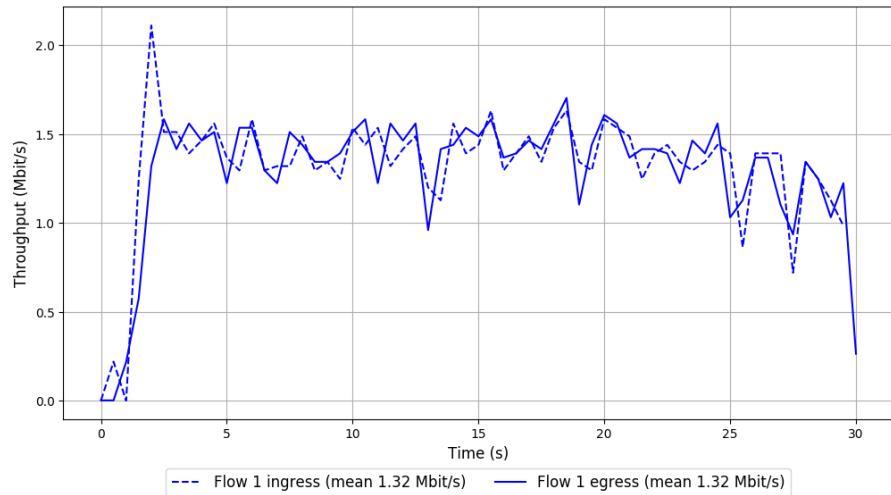


Run 2: Statistics of TCP Vegas

```
Start at: 2017-12-20 17:24:22
End at: 2017-12-20 17:24:52
Local clock offset: -0.029 ms
Remote clock offset: 14.943 ms

# Below is generated by plot.py at 2017-12-20 17:49:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 512.086 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 512.086 ms
Loss rate: 0.30%
```

Run 2: Report of TCP Vegas — Data Link

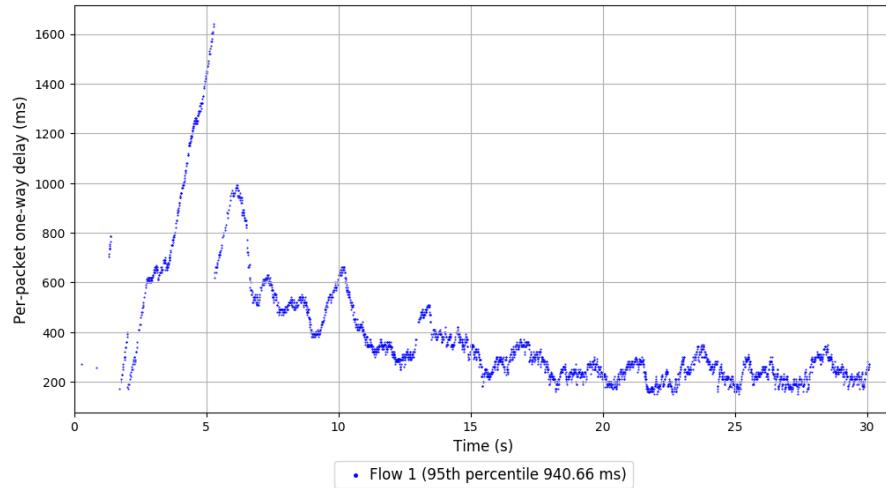
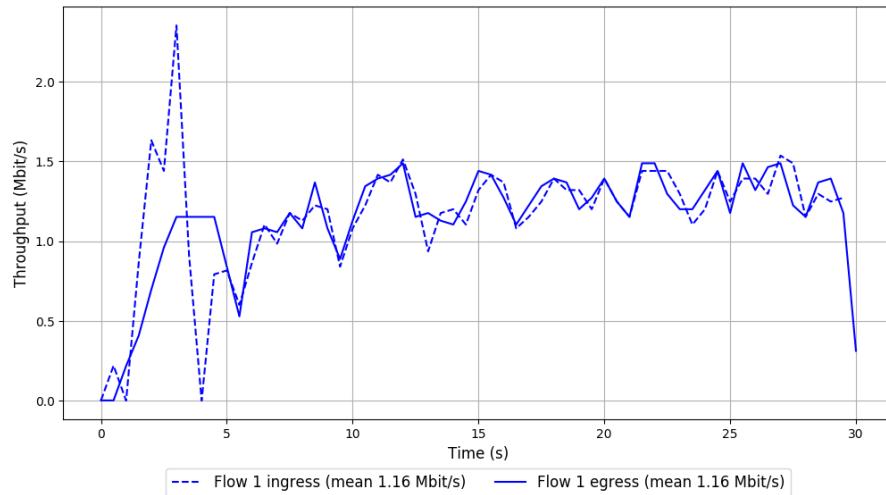


Run 3: Statistics of TCP Vegas

```
Start at: 2017-12-20 17:42:00
End at: 2017-12-20 17:42:30
Local clock offset: -0.09 ms
Remote clock offset: 16.469 ms

# Below is generated by plot.py at 2017-12-20 17:49:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 940.656 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 940.656 ms
Loss rate: 0.45%
```

Run 3: Report of TCP Vegas — Data Link

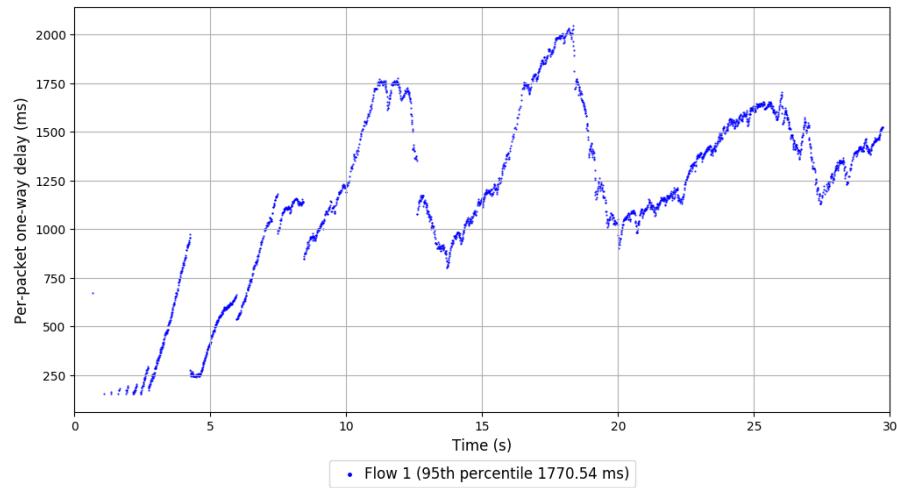
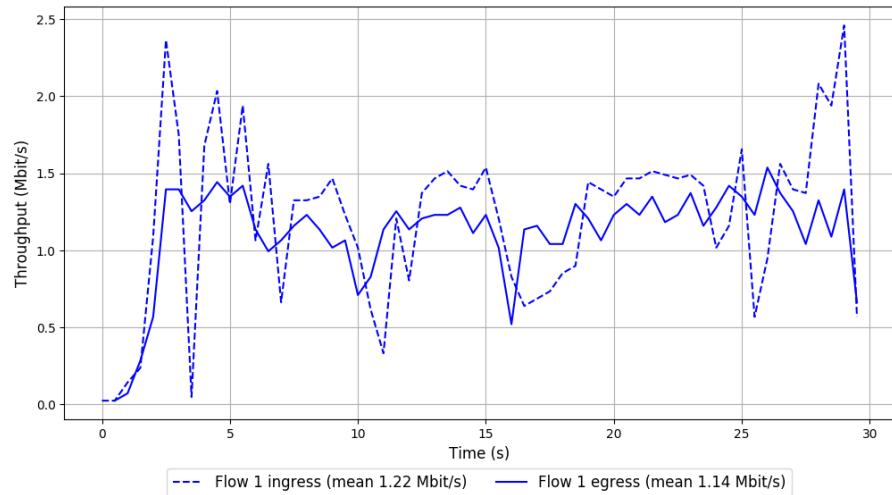


Run 1: Statistics of Verus

```
Start at: 2017-12-20 17:00:46
End at: 2017-12-20 17:01:16
Local clock offset: -0.028 ms
Remote clock offset: 15.268 ms

# Below is generated by plot.py at 2017-12-20 17:49:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 1770.538 ms
Loss rate: 8.56%
-- Flow 1:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 1770.538 ms
Loss rate: 8.56%
```

Run 1: Report of Verus — Data Link

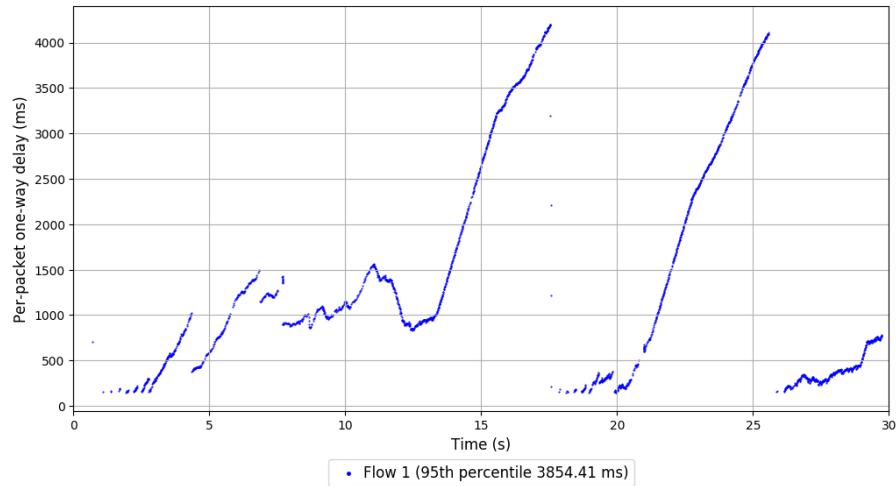
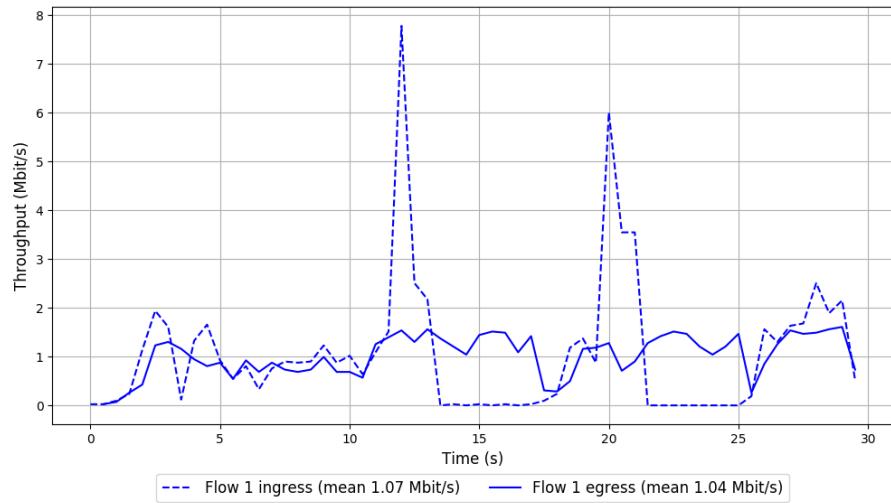


Run 2: Statistics of Verus

```
Start at: 2017-12-20 17:18:27
End at: 2017-12-20 17:18:57
Local clock offset: -0.04 ms
Remote clock offset: 10.093 ms

# Below is generated by plot.py at 2017-12-20 17:49:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 3854.407 ms
Loss rate: 4.59%
-- Flow 1:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 3854.407 ms
Loss rate: 4.59%
```

Run 2: Report of Verus — Data Link

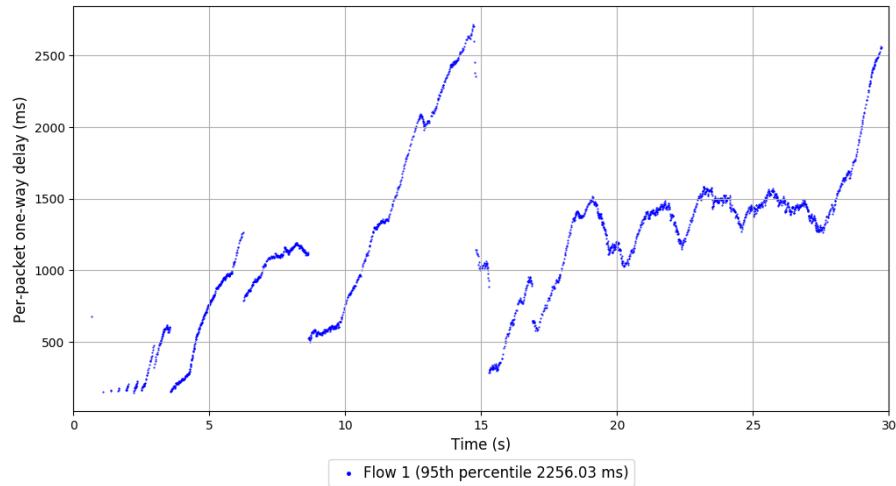
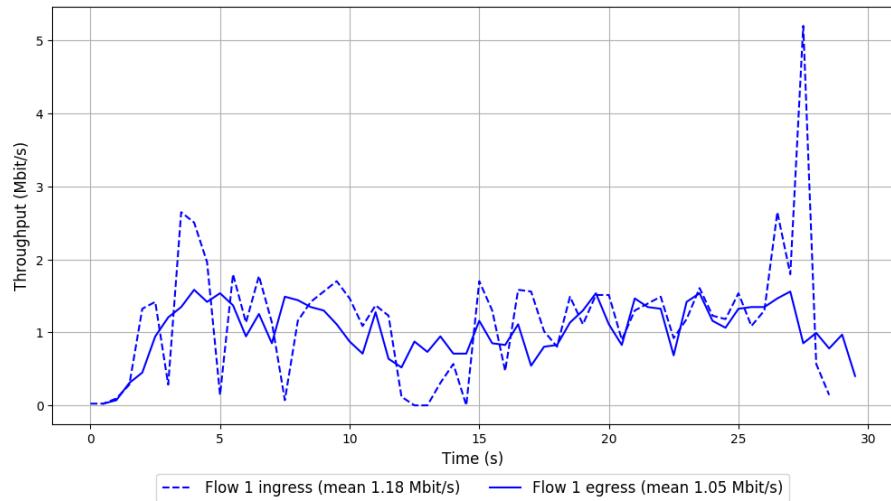


Run 3: Statistics of Verus

```
Start at: 2017-12-20 17:36:06
End at: 2017-12-20 17:36:36
Local clock offset: -0.023 ms
Remote clock offset: 10.32 ms

# Below is generated by plot.py at 2017-12-20 17:49:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 2256.027 ms
Loss rate: 10.41%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 2256.027 ms
Loss rate: 10.41%
```

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

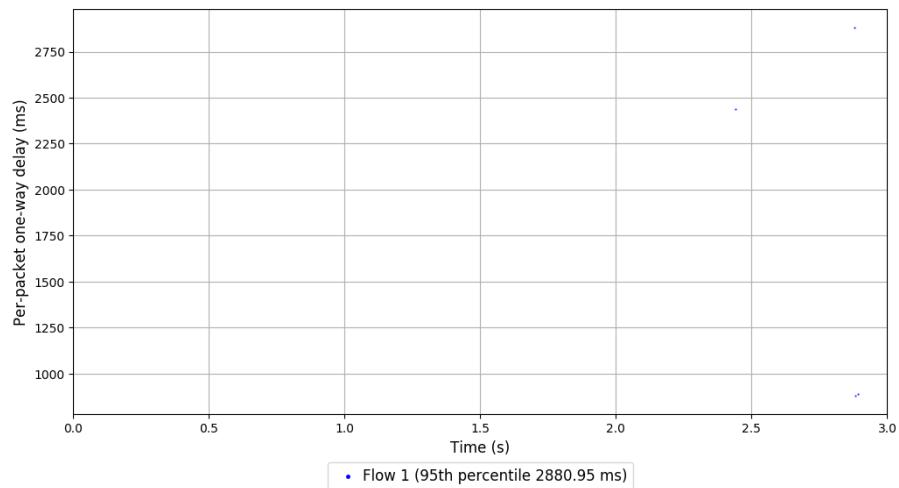
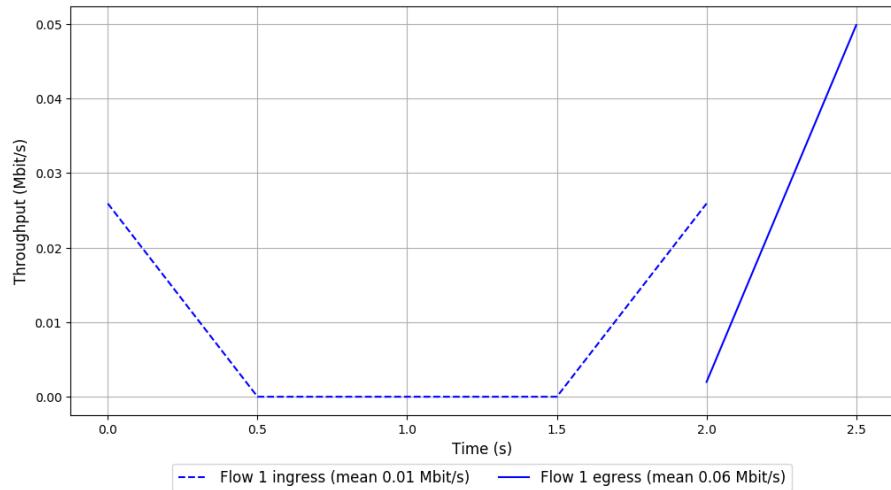
Start at: 2017-12-20 17:04:18

End at: 2017-12-20 17:04:48

Local clock offset: -0.02 ms

Remote clock offset: 9.549 ms

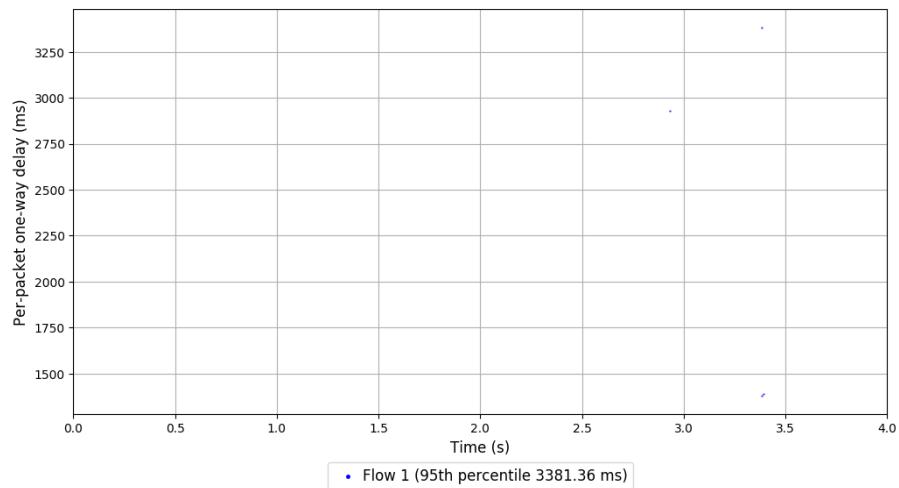
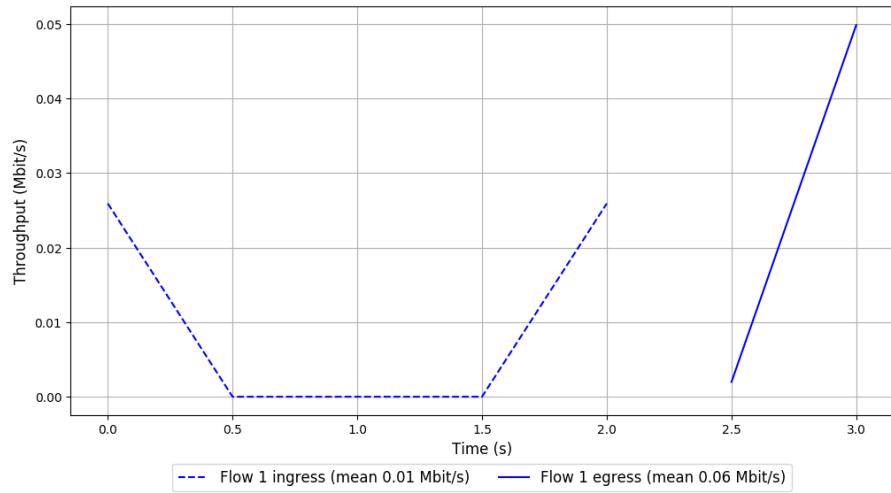
Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2017-12-20 17:21:59
End at: 2017-12-20 17:22:29
Local clock offset: -0.034 ms
Remote clock offset: 10.114 ms

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

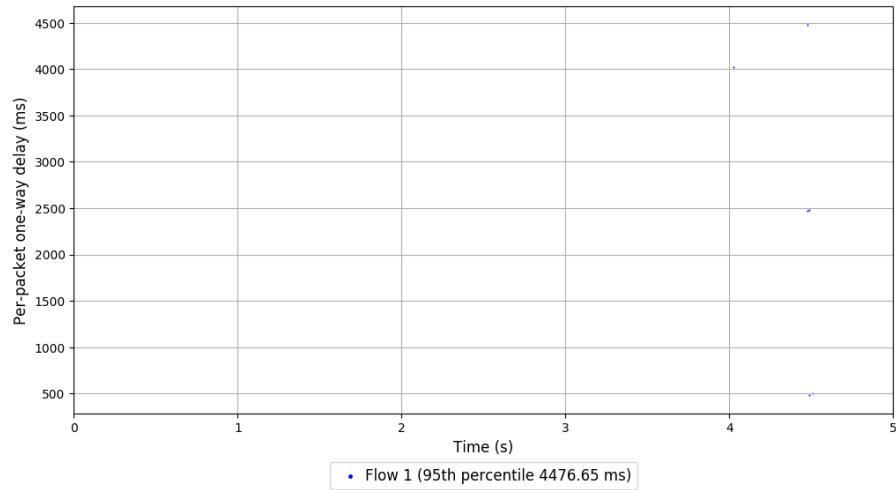
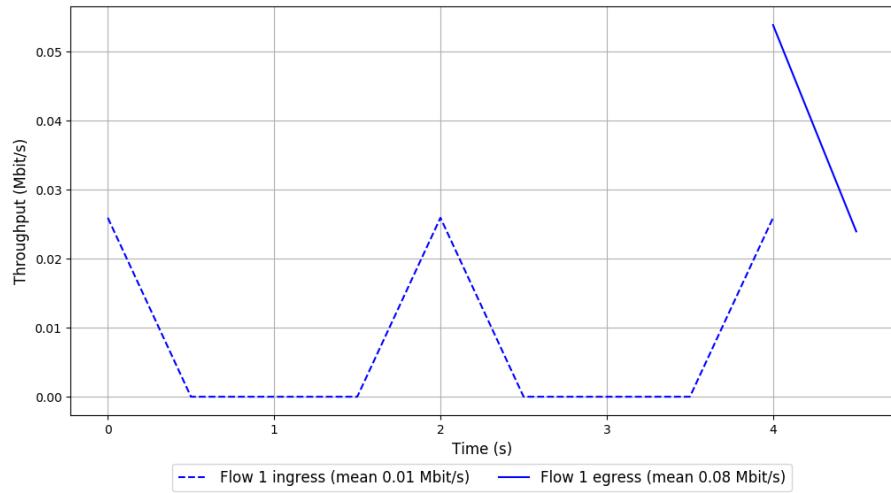
Start at: 2017-12-20 17:39:38

End at: 2017-12-20 17:40:08

Local clock offset: -0.03 ms

Remote clock offset: 15.643 ms

Run 3: Report of Copa — Data Link

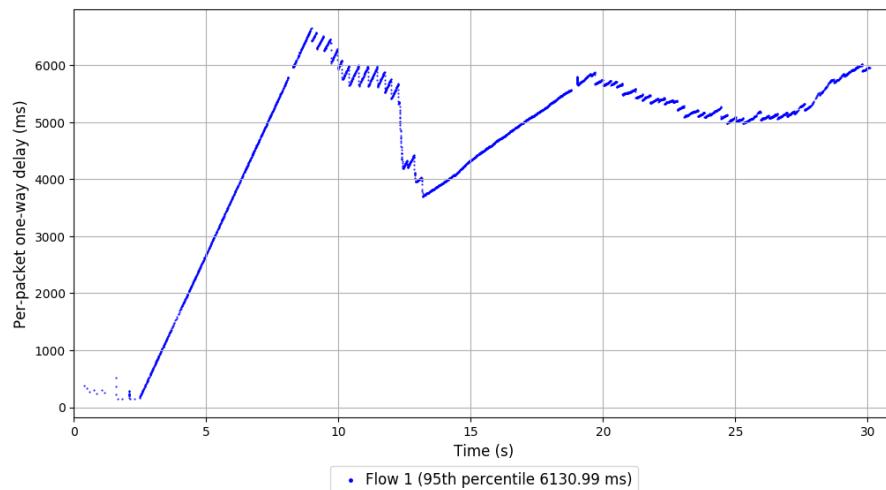
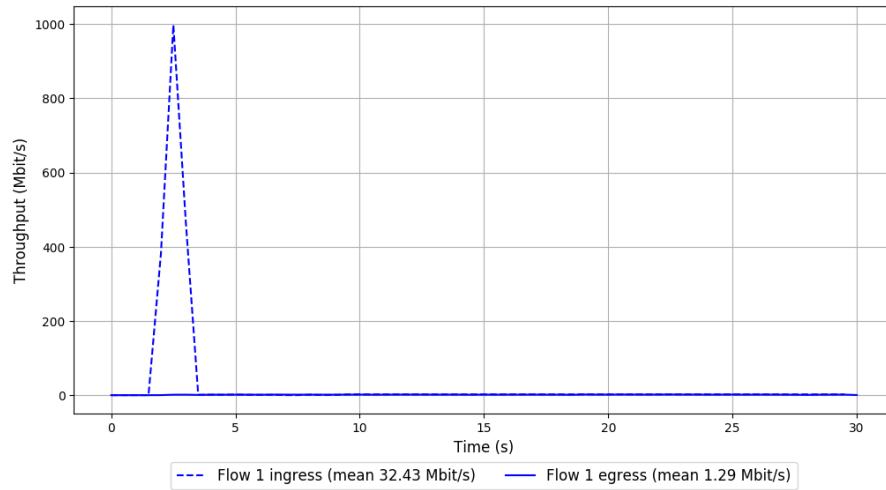


```
Run 1: Statistics of FillP
```

```
Start at: 2017-12-20 17:05:29
End at: 2017-12-20 17:05:59
Local clock offset: -0.032 ms
Remote clock offset: 16.211 ms

# Below is generated by plot.py at 2017-12-20 17:49:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 6130.991 ms
Loss rate: 96.05%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 6130.991 ms
Loss rate: 96.05%
```

Run 1: Report of FillP — Data Link

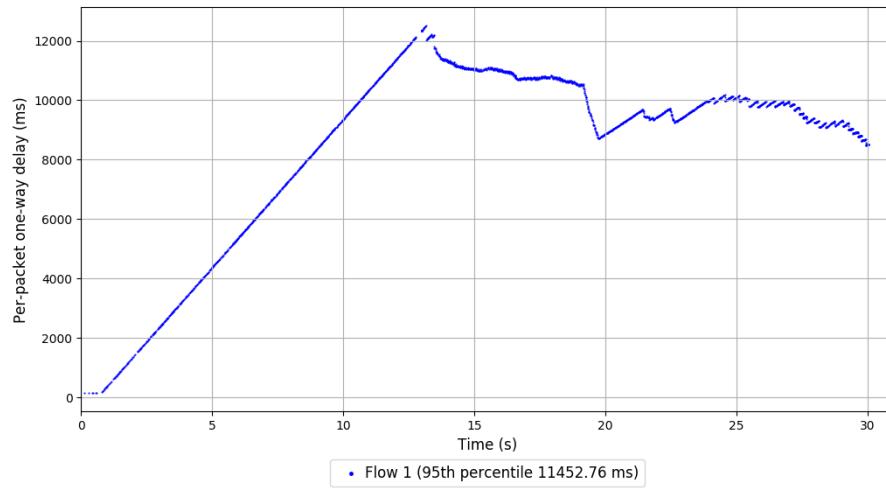
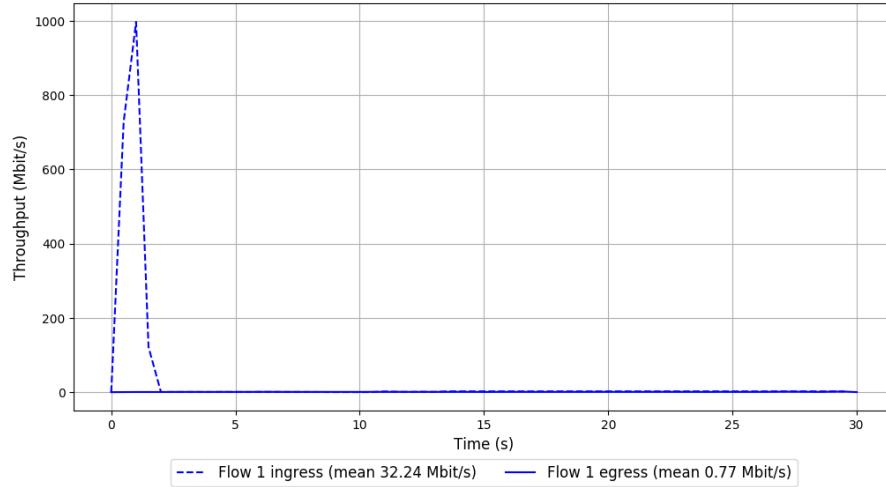


Run 2: Statistics of FillP

```
Start at: 2017-12-20 17:23:10
End at: 2017-12-20 17:23:40
Local clock offset: -0.089 ms
Remote clock offset: 10.893 ms

# Below is generated by plot.py at 2017-12-20 17:49:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 11452.765 ms
Loss rate: 97.62%
-- Flow 1:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 11452.765 ms
Loss rate: 97.62%
```

Run 2: Report of FillP — Data Link

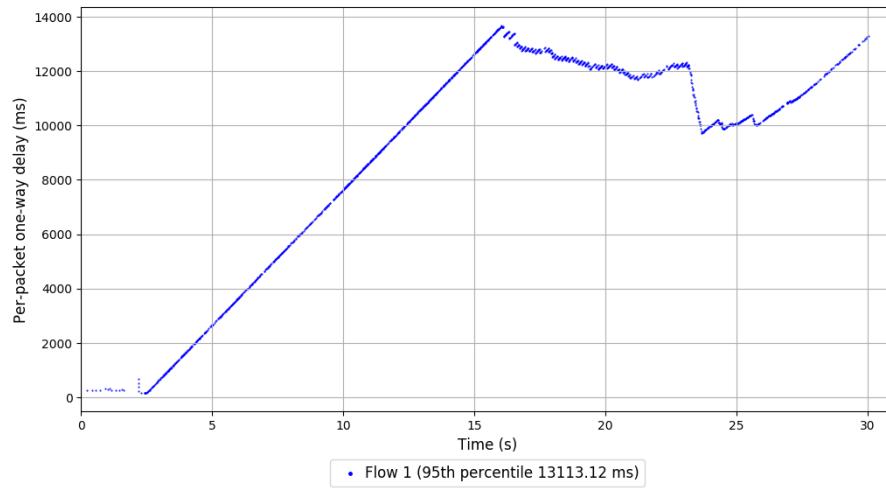
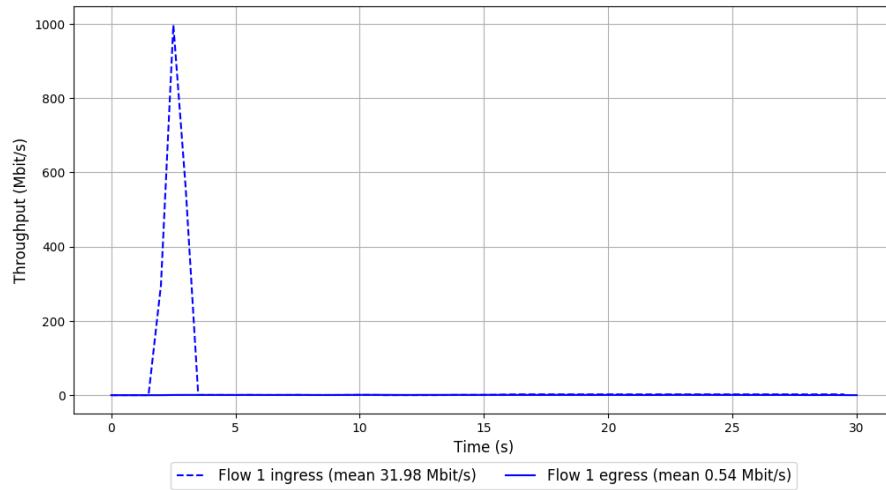


Run 3: Statistics of FillP

```
Start at: 2017-12-20 17:40:49
End at: 2017-12-20 17:41:19
Local clock offset: -0.033 ms
Remote clock offset: 16.548 ms

# Below is generated by plot.py at 2017-12-20 17:49:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 13113.123 ms
Loss rate: 98.32%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 13113.123 ms
Loss rate: 98.32%
```

Run 3: Report of FillP — Data Link

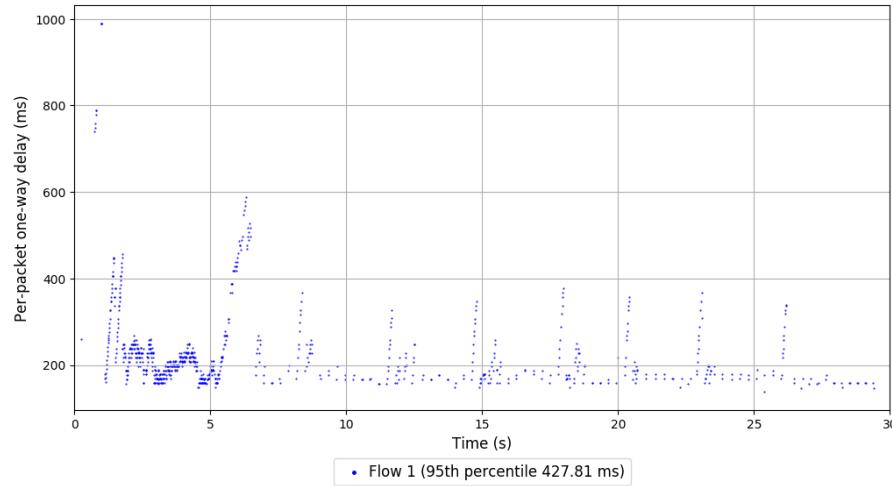
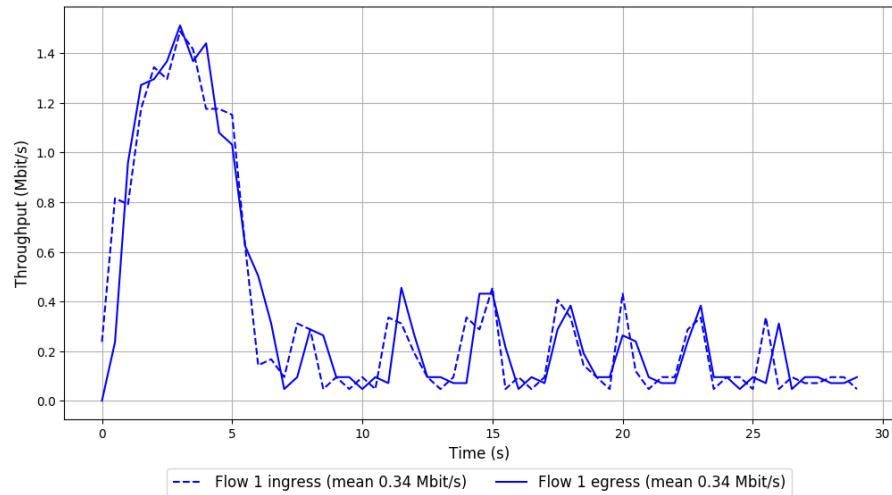


Run 1: Statistics of Indigo

```
Start at: 2017-12-20 17:07:50
End at: 2017-12-20 17:08:20
Local clock offset: -0.031 ms
Remote clock offset: 9.701 ms

# Below is generated by plot.py at 2017-12-20 17:49:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 427.814 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 427.814 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

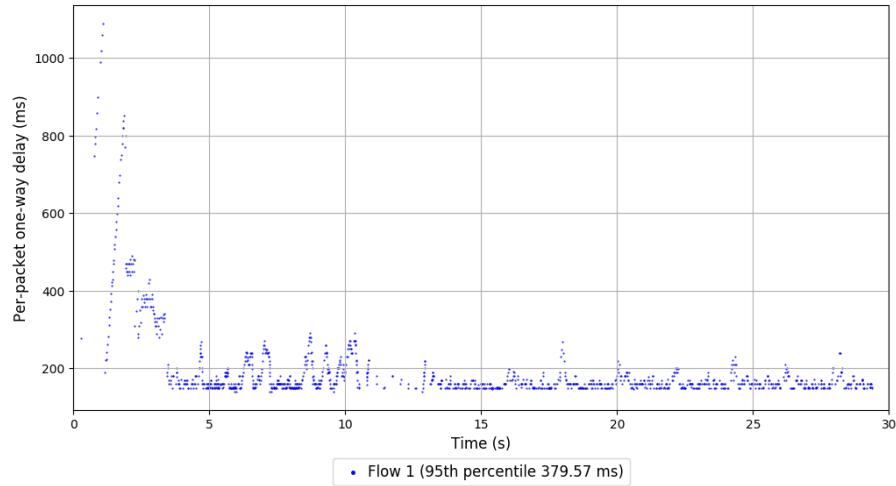
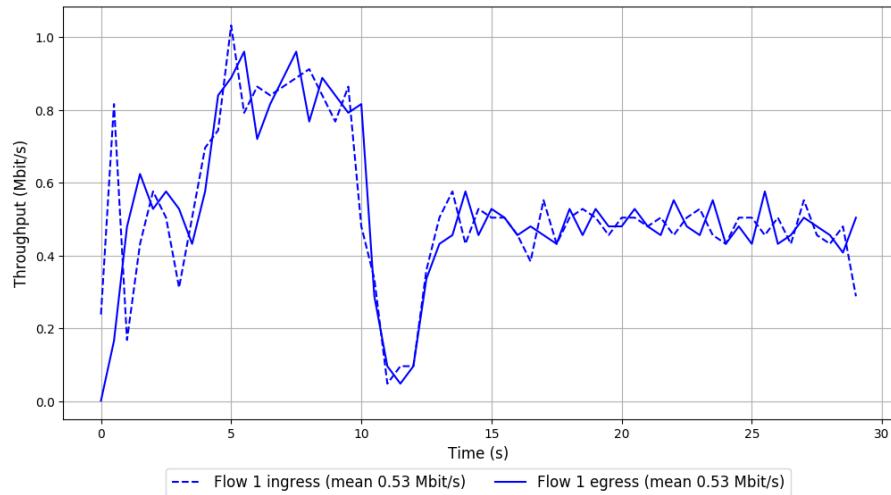


Run 2: Statistics of Indigo

```
Start at: 2017-12-20 17:25:32
End at: 2017-12-20 17:26:02
Local clock offset: -0.016 ms
Remote clock offset: 10.871 ms

# Below is generated by plot.py at 2017-12-20 17:49:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 379.566 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 379.566 ms
Loss rate: 0.16%
```

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

```
Start at: 2017-12-20 17:43:11
End at: 2017-12-20 17:43:41
Local clock offset: -0.107 ms
Remote clock offset: 9.985 ms

# Below is generated by plot.py at 2017-12-20 17:49:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 230.861 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 230.861 ms
Loss rate: 0.16%
```

Run 3: Report of Indigo — Data Link

